

# AGRA UNIVERSITY

## Text-books & Syllabuses

PRESCRIBED FOR THE EXAMINATIONS  
MENTIONED BELOW :

### 1948

[1] M.A. (Prev.)—[a] English [b] Marathi [c] Mathematics ;  
Geography ; [2] B. T. ; [3] M. Sc. (Prev.)—All subjects  
cept (Physics and Botany) ; [4] LL. B. (Prev.)

### 1949

[1] B. A. ; [2] M. A. (Prev.) (a)—Arabic. [b] Persian  
Sanskrit, [d] Hindi, [e] Urdu, [f] Philosophy, [g] Economics  
History, [i] Political Science ; [3] M. A. (Fin.) All subjects ;  
[4] B. Sc. ; [5] M. Sc. (Prev.)—Physics and Botany ; [6] M. Sc.  
(in.)—All subjects ; [7] LL.B. (Fin.) ; [8] LL.M. ; [9] B. Com.  
[10] M. Com. ; [11] B. Sc. (Ag.) ; [12] M. Sc. (Ag.) ;  
[13] First M. B., B. S.

### 1950

[1] Second M. B., B. S. ; [2] Final M. B., B. S. (Part I)  
Final M. B., B. S. (Part II),

PART I.—Faculty of Arts	10 Annas
PART II.—Faculty of Science	5 Annas
PART III.—Faculty of Law	5 Annas
PART IV.—Faculty of Commerce	5 Annas
PART V.—Faculty of Agriculture	4 Annas

## GAYA PRASAD & SONS

*Educational Booksellers & Publishers*

Hospital Road, AGRA.

# Agra University

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## TEXT-BOOKS AND SYLLABUSES PRESCRIBED FOR THE EXAMINATIONS OF 1948 AND 1949.

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### B. A. EXAMINATION—1949.

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#### GENERAL ENGLISH

There will be two papers.

Paper I. — Essay and Unseen

(1) An essay designed to test the powers of the student to write clearly and correctly on a subject with which he may be expected to be acquainted and (2) an unseen passage from a modern book, magazine, or newspaper designed to test the candidate's knowledge and intelligent appreciation of present-day topics and his ability to write a clear *precis*, together with exercises on idiom.

Books recommended:—

FOWLER : The King's English. (O. U. P.)

FOWLER : Dictionary of Modern English Usage.  
(O. U. P.)

MILLER : Hints on the Art of English Composition  
in prose and verse (Gaya Prasad & Sons,  
Agra).

Paper II.—General Composition.

Subjects for short essays will be set from the following books, which are not meant for detailed study:

A. F. SCOTT : Modern essays, Second Series, 1941-43  
(Macmillan & Co.) The Sections entitled  
'Looking to the Future' 'Science' and 'The  
War' only are prescribed.

C. K. ALLEN : Democracy and the Individual. (O. U. P.)

DEAN INGE : Five Essays, edited by E. A. Wodehouse and published by Longmans Green & Co. Ltd.

One Act Plays of To-day. Series I (Harrap).

## ENGLISH LITERATURE

Paper I.—Shakespeare and Drama.

SHAKESPEARE : A Midsummer Night's Dream. Hamlet.

JOHN DRINKWATER : Abraham Lincoln, annotated by  
F. H. W. Spenslow (Longmans  
Green & Co.).

Paper II.—Poetry.

C. B. YOUNG : Great English Poems. (O. U. P.)

The following poems are prescribed:—

1. MILTON : Lycidas.
2. WORDSWORTH : Lines composed near Tintern Abbey.  
do. Ode on Intimations of Immortality from  
Recollections of Early Childhood.
3. SHELLEY : Ode To the West Wind.
4. KEATS : The Eve of St. Agnes.  
do. Ode To a Nightingale.
5. TENNYSON : The Lotos Eaters.
6. BROWNING : The Last Ride Together.  
do. Rabbi Ben Ezra.
7. ARNOLD : The Scholar Gipsy.
8. THOMPSON : The Hound of Heaven.
9. GIBSON : Flannan Isle.
10. BROOKE : The Great Lover.
11. OWEN : Strange Meeting.

Paper III.—Prose.

JOHN BAILEY : Dr. Johnson and his Circle. (Home  
University Library, O. U. P.)

SIR HUGH WALPOLE : The Prelude to Adventure. (The  
World's classics Series, published  
by the Oxford University Press).

G. F. J. CUMBERLEGE : Several Essays (O. U. P.) *omitting*  
Nos. 4, 5, 6, 7 and 8 from Sec. IV, Essays in Criticism.

Note 1.—Passages for explanation with reference to the context  
will not be set from the Novel prescribed under Paper III.

Note 2.—Candidates will be expected to show familiarity with the  
principal metrical forms of English verse.

The following books are recommended :—

FOR : Modern English Metre (C. U. P.).

SMITH : Essay writing, Rhetoric and Prosody  
(O. U. P.)

IE : English Prosody for Indian Students  
and Teachers (Longmans Green & Co.)

BRANDER : Rhetoric and Prosody (O. U. P.).

Note 3.—Candidates are expected to show some acquaintance with the main outlines of the history of English Literature during the periods covered by the prescribed texts.

The following books are recommended :—

EMILE LEGOIS : A Short History of English Literature.  
(O. U. P.)

BERNARD GROOM : A History of English Literature  
(Longmans Green & Co.)

MAIR : Modern English Literature (Home Univ.  
Library).

STOPFORD BROOKE : A Primer of English Literature (Mac-  
millan).

B. P. BAGCHI : Pages from the History of English  
Literature (published by Har Prasad  
Bhargawa, Agra).

G. E. HOLLINGWORTH : A Primer of Literary Criticism  
Univ. Tut. Press)

GILKES : A key to Modern English Poetry  
(Blackie & Sons Ltd.)

PENDLEBURY : English Lyrical Types (Blackie).

#### ARABIC

Paper I.—Texts—Selections in Arabic Prose and Verse,  
approved by the Allahabad University (Anwar  
Ahmadi Press, Allahabad).

Omit—Selection from—

كتب الشعرا and مقامات بديعي

first 8 maqamat (Mujtabai  
Press, Delhi)

ادب العرب از مولوي زيود احمد

Paper II.—Grammar (up to the end of  
Fusul al-Bari Khasiyat-i-Abwab and  
Hidayat al-Khur)

Questions on Grammar will be set in both the papers.

Paper III.—Rapid Reading and Translation from English  
into Arabic.

Recommended for Rapid Reading :—

خلاصه آداب الغته العربيه (Anwar Ahmadi Press,  
Allahabad).

Note.—Arabic words must be written in Arabic character.

#### PERSIAN

Paper I.—Prose.

- (1) چہارمقالہ-متمالت دوم-درماہوت علم شعر و صلاحوت شاعر  
 (2) نظام الملک طوسی — سیاست نامہ — ”اندر غمال و  
 برسیدن پیوستہ از احوال و زیدان و عاملان“ تا درکار ہابرا و ہیچ  
 چیز پوشیدہ نہ ماند بتوفیق اللہ تعالیٰ

(3) ابوالفضل-انشاء

(1) خطاب حضرت شاہنشاہی بشاہ عباس

(2) نامہ حضرت شاہنشاہی بشرفاخر رام مکہ معظمہ

(4) آئین اکبری

(1) آئین بار

(2) آئین و ہنمونی

(5) علاءالدین ابن عطا ملک جوینی — تاریخ جہانکشا

(1) ذکر قواعدی کہ چلگہز خان بعد از خروج نہاد و

یاساھا کہ فرمود

(2) ذکر خروج چلگہز خان و ابتدائے انتقال دولت و

مملکت از ملوک جہاں بدو و احوال ان بر جدول

ایجاز

(6) نورالدین ظہوری ندرتوئی

نثر اول از سہ نثر

Note 1.—Nasrah نقرہ published by Kitabistan, Allahabad,  
 which includes the above selections, is recommended.

Note. 2.—Questions on Grammar will be included in this paper.

Paper II.—Poetry.

قصائد خاقانی (1)

(1) دل من پور تعلوم است و من طغل زبانداش

نماز مودہ (ii) نہ چون جہوپال.....خاقاناش (i) *excluding*

سگ میانے (iv) تعلوم الملک.....مستاناش (iii) جاناش.....

زمین دایہ.....دستاناش (v) جاناش.....

(2) صبتدم چون کالہ بند آہ دود آسائے من

.....چشمہ صلب (ii) چوں.....والائے من (i) *cluding*

الگرچہ.....استہزائے من (iii) اجزائے

## (2) — قصاید انوری

- (۱) اے قاعده تازه ز دست تو کرم را  
(۲) جرم خورشید چو از حوت در آید بحمل

## (3) قصائد عرفی

- (۱) اے متاع درد در بازار جان انداخته  
(۲) اقبال کرم می گزد ارباب هم را

## (4) قصائد فیضی

- (۱) یا ازلی الظهور یا ابدی الخفا  
(۲) اے نقد عقل و شرع ندانم چه گوهری

## (5) قصائد قانعی

- (۱) نسیم خلد می و زد مکرز جوئیاریها  
(۲) از مروش و حد تم در گوش هوش آمد خطاب

## (6) زبور عجم

صفحه لمبر

- ۹ اے که زمین فزوده گرمی آه و ناله را  
۲۹ این جهان چیست صفم خانه پندار نیست  
۵۷ دوست کشمکش مده این دل بیقرار را  
۸۹ لاله این چمن آلوده رنگست هنوز  
۱۰۰ تکیه بر حجت و اعجاز بهان نیز کنند  
۱۱۰ فرشته گرچه برون از طلسم افلاک است  
۱۲۶ از همه کس کناره گیر صحبت آشنا طلب

## (7) غزلیات عراقی

- ۱ — نخستین باده گاندر جام کردند  
۲ — یه شراره قلندر بزن ار حریف مائی  
۳ — در صومعه نه گنجید رند شراب خانه

## (8) غزلیات سعدی

- ۱ — پیش ما رسم شکستن نبود عهد وفا را  
۲ — بیا که نوبت صلح است و روزگار عنایت  
۳ — ز من این عیب قدیمست و می نرود

## (9) غزلیات حافظ

- ۱—دوش وقت سحر از غصه نجانم دادند
- ۲—دوش دیدم که ملائک در میخانه زدند
- ۳—دشمن باغم بسر بردن جهاں یکسر نمی آرد

## (10) غزلیات عرفی

- ۱—نوشتارو نشه علت نهد در جان ما
- ۲—زبان زنگنه فروماند و راز من باقیست
- ۳—از دیده ام کدام نفس خون نمی رود

## (11) غزلیات فطری

- ۱—از کف نمی دهد دل آسان روبرو را
- ۲—ترا یکعبه مرا کار بادل افتاد است
- ۳—چه خوش سب از درو یکدل سر حرف باز کردن

## (12) غزلیات صائب

- ۱—عشق یکسان ناز درویش و توتگر می کشد
- ۲—باد مطلب می رسد حویای کام آهسته آهسته
- ۳—نه چهره اش عرق از گرمی هوا کرد دست

## (13) غزلیات ابوطالب کلیم

- ۱—پیری رسید و مستی طبع جوان گذشت
- ۲—از ثبات عشق داتم پا به دامن داشتم
- ۳—نه همین می دمد آن نو گل خندان از من

## (14) غزلیات غالب

- ۱—اے که گفتم ندهی داد دل آری ندهی
- ۲—خوش بود فارغ ز بند کفر و ایمان زیستن
- ۳—یارب ز جنون طرح غم در نظرم ریز

## (15) مثنوی سکندر نامه نظامی

۱—حمد

۲—مناجات

۳—نعت

۴—پهروزی یافتن اسکندر بر دارا و کشته شدن دارا

- Note 1.—Questions on Rhetoric will be included in this paper.  
 Note 2.—A general sketch of the History of Literature with reference to the authors prescribed in the text is particularly expected.

For the History in Literature "An Outline History of Persian Literature by A. H. Faridi" (Ram Prasad and Bros. Agra) and "Maasiri Ajam by Mohammed Azimul-Haq Junaidi" (Shah & Co. Agra) are suggested.

Paper III.—Rapid Reading and Translation.

Adabiyat-i-Ajam, Part III (Revised edn. 1943), published by Ram Prasad and Sons, Agra).

Students who offer Persian are required to have such knowledge of the Etymology of the Arabic language as will enable them to explain all Arabic words and phrases which may occur in the text-books and in the books recommended for Rapid Reading in Persian.

Note.—Persian words must be written in Persian character.

### SANSKRIT

Paper I.—Poetry and Drama

- (i) KALIDASA ; Abhijnana Sakuntalam.
- (ii) Bharavi Kirtarjuniya, Canto II.

Paper II.—Prose, History of Literature and *either* Rhetoric or Elements of Hindu Culture.

- (i) Sanskrit Gadya Manjari (Gautam Bros. and Co., Cawnpore).
- (ii) *History of Sanskrit Literature* dealing with the Epics, the Kavyas, Lyric Poetry, Drama, Fairy Tales and Fables.

Books recommended—

KEITH : Classical Sanskrit Literature (Heritage of India Series).

'Sanskrit Sahitya ki Ruparekha' published by Sahitya Niketan, Cawnpore.

MACDONELL : History of Sanskrit Literature, Chapters X—XIV and XVI.

Pendse : संस्कृत वाङ्मन्याचा इतिहास.

(iii) *Either—*

Elementary knowledge of Alankaràs from Kaya-Dipika, Astam Shikha (excluding Astam-Shikha)



Or

Elements of Hindu Culture.

- (1) The Family—The Sanskaras and Ashramas, food, clothes and ornaments, house and furniture.
- (2) Community.—The Varnas and castes.
- (3) Society.—Economic Life—means of livelihood. Property—Possession and ownership. Agriculture, Industry, Trade, Commerce, Coinage, Origin of writing.
- (4) Political Organisation.—Sources of Revenue. Spiritual and Temporal Power.

Kingdoms and Republics—Machinery of Government  
Royal Officers, Assemblies.  
Administration of Justice and punishments.

Books recommended—  
P. K. ACHARYA : Elements of Hindu Culture and Sanskrit Civilization.

MUKERJI (RADHAKUMUD) : Hindu Civilization  
Paper III.—Composition, Translation and Rapid Reading.  
BHASA : Swapnavasavadattam.

DR. RAGHURAN : Valmiki Ramayan (Abridged) published by G. A. Nateram, Madras.

Students should be taught to study these books by themselves with the help of a Sanskrit English dictionary.

Books recommended for Translation and Composition—  
CHARUDEVA : Manual of Translation.

DR. MANGAL DEV :—Prabandha Prakasa.

V. S. APTE : Guide to Sanskrit Composition.

General :

Grammar.—books recommended—

- (1) KALE or KEILHORN : Higher Sanskrit Grammar. General questions on Grammar will be set in Paper I only and not more than 10 per cent. of marks in that paper shall be allotted to them.

- (2) Explanation in Sanskrit or in Tika form should be set in books on poetry under Paper I, and marks, not more than 15 per cent. of marks in that paper, may be allotted to it.

Sanskrit must be written in Devanagari character.

## MODERN INDIAN LANGUAGES.

### HINDI

Paper I.—Prose and Drama Texts:

JAI SHANKER PRASAD : Dhruvaswamini,

RAM CHANDRA SHUKLA : Triveni.

(N. P., Sabha Kashi).

HARIHAR NATH TANDAN : Lekhmala.

(Gaya Prasad & Sons Agra).

PREM CHAND : Premashram

Books recommended—

JANARDAN PRASAD JHA : Prem Chand ki Upanyas kala.

MANAVA : Khari Boli ke Gaurava Granth.

BRAHM DUTT SHARMA : Hindi Sahitya men Nibandh.

(Gaya Prasad & Sons, Agra).

PREM NARAIN TANDAN : Prem Chand aur Gramsamasya.

Paper II.—Poetry Texts.

JAGANNATH TIWARI : Sankshipt Ram Chandrika.

(Gaya Prasad & Sons, Agra).

MUNSHI RAM SHARMA : Sur Shatak.

(Shukla Sadhana Mandir, Cawnpore. Price Rs. 1-8)

SHRIDHAR PANT : Tulsi Prabha.

(Lakshmi Narain & Sons, Agra).

SOM NATH GUPTA : Prabandh Kavya Sangrah.

(Indian Press Ltd., Allahabad. Price Rs. 1-8)

The following syllabus is prescribed in Rhetoric :—

(a) अलंकार -

(i) शब्दालंकार—वक्रोक्ति, अनुप्रास, यमक, श्लेष ।

(ii) अर्थालंकार—उपमा, पूर्णोपमा, लुप्तोपमा, मालोपमा, प्रतीप रूपक, उल्लेख, स्मरण, भ्रांति, सदेह, अमृदुति, उत्प्रेक्षा ( वस्तु, हेतु, फल ), अतिशयोक्ति, दीपक, निदर्शना, व्यतिरेक, सहोक्ति, परिकराङ्कुर, अप्रस्तुतप्रशंसा ( अन्योक्ति ), विभावना, असंगति. यथासंख्य या क्रम, परिसंख्या, अर्थान्तरन्यास, दृष्टान्त, मुद्रा, तद्गुण, अतद्गुण, मीलित और उन्मीलित ।

(b) रस—रस और भाव—

रस निष्पत्ति ( विभाव, अनुभाव, संचारी )

(c) दोष—श्रुतिकटुत्व, न्युतसंस्कृति, अश्लीलत्व, अप्रतीतत्व, ग्राम्यत्व, क्लिष्टत्व, न्यूनपदत्व, अधिक पदत्व, अक्रमत्व, पुनरुक्ति और दुष्क्रमत्व ।

Books recommended—

RAM KRISHAN SHUKLA : Sukavi Samiksha.

S. S. DAS : Hindi Sahitya.

RAM KRISHNA SHUKLA : Kavyajigyasa.

KRISHNA SHANKAR SHUKLA : Keshava-ki-kavyakala.  
(Sahitya Granthmala Karyalaya, Kashi).

Paper III.—Translation and Composition.

Translation from English into Hindi and Composition.

Book recommended—

RAM CHANDRA VERMA : Achchi Hindi (Revised Edition, Sahitya Ratna Mala, Karyalaya, Benares—Price Rs. 2.)

URDU

Paper I—Prose.

(۱) نقیض ناہید—از پروفیسر مجنون گورکھپوری سیدت ایڈیٹرز  
کالج گورکھپور -

(۶) اردو نثر کے نمونے مرتبہ پروفیسر محمد طاہر فاروقی-شائع  
کردہ شاہ ایڈیٹ کمپنی - حیدر آباد دہلی -

(۳) دہلی کی آخری شمع از مرزا فیض اللہ بیگ -

(۴) نھرنگ خیال حصہ اول مصنفہ مولانا آزاد دہلی -

Paper II.—Poetry

(a) Marsia,

(۱) مرثیہ اندیس ”پہلا شوق سے چرخ  
یہ جب لالہ زار صبح از کمال اندیس“ مرتبہ -  
حامد حسن قادری شائع کردہ گہا پرشاد ایڈیٹ سنس  
یداد پورہ آگرہ -

(b) قصائد و غزلیات

(۶) دامن گلچیں شائع کردہ گہا پرشاد ایڈیٹ سنس—آگرہ

(c) Modern Poetry,

(۳) خضر راہ {  
(۴) طلوع اسلام { از ڈاکٹر سر اقبال -

Books to be consulted—

(۱) نئے ادبی رجحانات از سید اعجاز حسین -

(۲) تاریخ و تہذیب ادبیات اردو مصنفہ حامد حسن قادری -  
مطبعة

mi Narain Agarwal, Agra

(۳) صحیفہ تاریخ اردو مرتبہ مخدوم اکبر آبادی

شائع کردہ گیہا پرشاد ایلڈ سنس پبلشرز آگرہ -

(۳) اردو کے اسلوب بیان مصلفہ ڈاکٹر سید محی الدین قادری -

(۵) عطر عروض مصلفہ نواب احسان علی آف باندہ - مطبوعہ نظامی پریس لکھنؤ -

(ملنے کا پتہ شاہ ایلڈ کمپنی - حکیم وصی رتہ آگرہ)

(۱) داستان تاریخ اردو شائع کردہ  
Lakshmi Narain Agarwal, Agra.

(۷) تلمیذی اشارے از آل احمد سرور -

(۸) اقبال از پروفیسر مجلیوں گورکھ پوری - سہیت ایلڈ روز  
کالج گورکھ پور -

(۹) تلمیذی جایزے از سید اختشام حسوں پروفیسر لکھنؤ  
یونہورسٹی -

Note.—[a] The evolution of Ghazal in its various branches (mystic, philosophic, didactic, lyric, etc.) should be studied.

[b] Questions on the general History of Literature and criticism of the authors studied will be set in both Papers I and II.

[c] Candidates will be expected to know the peculiarities of the dialect (Lucknow or Delhi), in which each work is written, and the distinctive feature and merits of each writer.

Paper III.—Translation and Composition.

(a) Translation from English into Urdu.

(b) Essay in Urdu.

Note.—The following book is recommended to suggest the type of the English passages for translation into Urdu.

Selected English pieces for Urdu Translation.

(Gaya Prasad & Sons, Agra).

### MARATHI

There shall be three papers of three hours' duration. The first paper will be set on the prescribed prose texts and criticism. The second paper on the poetry texts and criticism the third paper on (1) Translation from English into Marathi and (2) Marathi Composition and general reading. Candidates are expected to select in the third paper only of the two forms (b).

The ability of the candidates to read and write मोडी (Modi) will be tested by means of a question or questions set in the third paper.

Candidates are expected to possess an adequate knowledge of general Marathi grammar [derivation of तद्धव [tadbhavas), प्रयोग (Prayoga) in particular as based on शास्त्रीय मराठी व्याकरण by दामले, with general knowledge of the history of the origin and growth of the Marathi language.

N. B.—In all papers rules regarding spelling of Marathi words recommended by the Maharashtra Sahitya Parishad, Poona (महाराष्ट्र-साहित्य परिषद, पुणे) may be observed.

*Paper I.—Prose Texts and criticism.*

- (1) Maharashtra Patrarupa Itihasa—Pages 1-53.  
Ed. Oturkar. (Published by the Anatha Vidyarthi Griha, Poona 2).
- (2) Vanmayavishayaka Nibandha, Vishnushastri Chiplunkar, Chitrashala Press, Poona 2.
- (3) S. M. MATE : Sahityadhara—(Tilak Road, Poona 2).
- (4) S. V. KETKAR : Brahmanakanya.
- (5) K. P. KHADILKAR : Svayamvara.

About 10 per cent. of the total number of marks will be reserved for philological and grammatical questions.

*Paper II.—Poetry texts and criticism.*

- (1) PROF. R. D. RANADE : Dnyaneshvaravachanamrita, Pages 1—136.
- (2) N. G. JOSHI : Rukminisvayamvara Eknatha. (Samartha Book Depot, Girgaum, Bombay 4.)
- (3) K. B. DAIHALE : Savarakaranchi Kavita.
- (4) MOROPANT : Shloka Kekavali.
- (5) P. M. LAD : Madhuparka.

About 10 per cent. of the total number of marks will be reserved for questions on poetics as in अभिनव काव्य प्रकाश

*Paper III.—Translation, Composition and Unseen.*

Questions on Marathi Composition will be in the form of an essay or essays based on the study of one of the two forms of literature prescribed below :

They will be approximately divided as follows :—

Translation from English into Marathi ...	10
Marathi Unseens ...	10
Marathi Composition ...	25

(iv) Modi reading and writing ... .. 5  
*Forms of literature.*

(a) Principles of criticism and representative texts.

1. CHIPLUNKAR : Sanskrit Kavipanchaka—Chitrashala Press, Poona 2.

2. V. M. JOSHI : Vicharasaundarya.

3. N. S. PHADKE : Takiche Ghava.

4. V. S. KHANDEKAR : Gadakari Vyakti va Vanmaya.

5. MARDHEKAR : Vanmayina Mahatmata.

(b) Humour texts :

(1) S. K. KOLHATKAR : Sahityabattishi—Ed. 1938 (fourth Edition) Nos. 1, 8, 11, 15, 20, 21, 23, 26, 30 and 32,

(2) Natakyache tare.

(3) CAPT. LIMAYE : Vinodasagara [Latest edition].

(4) C. V. JOSHI : Erandache Gurhala.

(5) Upahasini [Poems]

Hasyavinodamimansa by N. C. Kelkar is recommended for general reading of the form.

Candidates are expected to answer in the form of a complete essay (narrative, descriptive, reflective, character study or critical type).

## PHILOSOPHY

There will be *three* papers :—

Paper I.—Psychology.

Either—

(a) *General Psychology*—

I The Problem, Data and Methods of Psychology. The Branches of Psychology.

II. Empirical facts about the relation of Body and Mind.

III. The general characteristics of Mental Life. The different Levels of Consciousness.

IV. Intelligence, its nature. Methods of testing Intelligence.

V. Learning, animal and human. Learning by Trial and Error. Learning by Imitation. Learning by Insight. Formation and breaking of Habit.

VI. Attention : its nature and relation to Consciousness. Kinds of Attention. Conditions of Attention.

VII. Perception and Sensation. The nature and characteristics of Perception. Illusions and their causes.

VIII. Memory : Learning, Retention, Recall, Recognition. Percept and Memory-image.

IX. Imagination: Kinds of Imagination Hallucinations and Delusions. Day Dreams. Dreams. Freud's theory of Dreams.

X. Thinking : Factors of advantage in Association. Reasoning.

XI. Feeling and Emotion. Emotion and Instinct. Emotion and its expression. The James-Lange theory of Emotion. Moods, Sentiments and Complexes.

XII. Conation, Reflex Acts, Conditioned Reflexes, Random Acts, Instinctive Acts, Ideo Motor Actions, Voluntary Actions.

XIII. Personality. Psycho-analysis. The Unconscious or Subconscious Mind.

Books recommended—

R. S. WOODWORTH : Psychology (Fifteenth Edn.)

ANGELL : Psychology (Revised edition).

And *Either* (i) Social Psychology or (ii) Child Psychology.

(i) Social Psychology—

1. The nature and scope of Social Psychology.
2. Instincts, Imitation, Suggestion and sympathy in Society. Nature, source and kinds of Suggestion. Conditions of Suggestibility.
3. The functions of Reason and Will in the Individuals and Society.
4. The Group Mind. The General Will. Different Theories
5. The Crowd Mind Deliberative Group Mind.
6. Tradition, Custom, Law, Fashion.
7. Community, Associations and Institutions.
8. The Public and Opinion.

Book recommended—

GINSBURG : The Psychology of Society (Methuen, London).

Or

(ii) Child Psychology—

1. The Scope and Method of Child Psychology.
2. Stages of bodily and mental development of the Child. Adolescence.
3. Heredity and Environment. Nature and Nurture. Native Behaviour, Reflexes, Instincts, General Innate  
s. Imitation. Suggestion, Sympathy, Play.

Method of modifying innate tendencies.

5. Learning. Manual Skill.

6. The Senses and Sense Training, Nature. Development and Training of the Child's Attention and Interest. Perception, Memory, Imagination. Language. Thinking and Reasoning. Their differences from the mental processes of adults.

7. Development of Sentiment and Character of the Child. Moral Development.

8. Subnormal and Supernormal Children. Problem Behaviour, Delinquency, Causes and Treatment.

9. Training in Responsibility.

Book recommended :—

NORWORTHY AND WHITLY : The Philosophy of Childhood (Macmillan).

Or

Paper I. (b) —General Psychology and Experimental Psychology—

(i) General Psychology. [*Syllabus the same as under (a) above*].

(ii) Elementary Experimental Work in Psychology.

Note.—There will be a practical examination for those offering Experimental Psychology.

The scope of the experimental work is indicated by Seashore's Elementary Experiments in Psychology by (Henry Holt & Co.)

Paper II.—Ethics.

1. The Problem, Scope and Methods of Ethics. Relation of Ethics to Psychology, Sociology, Politics, Economics, and religion.

2. Ethical concepts ; Good, Right, Duty, Virtue, Merit and Responsibility.

3. Psychological Basis of Ethics, Psychological analysis and Ethical significance of Desire, Volition, Motive, Intention, Conduct and Character.

4. Judgments ; Descriptive and Appreciative. Nature and object of moral judgment.

5. Principal theories of the nature of the 'Moral Standard' ;—

(a) The Standard as Law—External Law of the Tribe, the Society, the State, or God ; the Law of Conscience, Moral Sense ; Intuitionism ; the Law of Reason, Ethical Doctrines of Butler and Kant.



(b) The Standard as Pleasure—Hedonism, Psychological, Ethical and Evolutionary. Ethical doctrines of Bentham, J. S. Mill, and Herbert Spencer.

(c) The Standard as Perfection—Ethics of Self-Realization.

(d) The Standard as Value—Instrumental Value and Intrinsic Values, Principles of Organization of values.

(e) Ethical doctrines of Nietzsche and Gandhi.

6. Concrete Moral Life; Rights, Duties and Virtues. Justice, Benevolence and Ahimsa. The doctrine of Cardinal Virtues. The Individual and Society. Social Institutions, Property, Family and State. The Ethical basis and functions of the State. Theories of Punishment. Moral Evils, Moral Progress in the individual and Society.

Books recommended—

MACKENZIE : Manual of Ethics.

W. M. URBAN : Fundamentals of Ethics.

J. N. SINHA : A Manual of Ethics.

I Paper III—Metaphysics—

*Either (a) Western Metaphysics, or (b) Indian Philosophy.*

(a) Western Metaphysics—

S Introduction to philosophy.

o. I. GENERAL NATURE OF PHILOSOPHY and its relation to  
ar Science, Possibility and value of the Study; criticism of  
concepts; classification and fundamental problems of Philosophy.

Tl II. COSMOLOGY OR PHILOSOPHY OF NATURE. The conception of the Universe; Naturalism, Mechanism and Teleology; the Evolution theory in Modern Science and Philosophy.

III. ONTOLOGY OR PHILOSOPHY OF BEING—Monism, Dualism and Pluralism; Materialism, Idealism and its various forms; Phenomenalism, Absolutism.

Ad. IV. PSYCHOLOGY OR PHILOSOPHY OF MIND. Relation of the Philosophy of Mind to empirical psychology; the concepts of Soul, Self, Mind and Consciousness; the problem of Mind and body.

V. EPISTEMOLOGY OR THEORY OF KNOWLEDGE General  
of knowledge : Dogmatism and Authority : Scepticism  
ism : Sensationalism, Intuitionism and Mysticism,

the sources of knowledge ; Rationalism, Empiricism, Criticism ; Validity and truth ; Realism, Idealism Pragmatism.

VI. AXIOLOGY AND PHILOSOPHY OF RELIGION. Conception and relation of the absolute values. Truth, Beauty, Goodness ; Theology and the concept of God ; Deism, Pantheism and Theism.

Books recommended—

G. T. W. PATRICK : Introduction to Philosophy [ revised].

P. M. BHAMBHANI : Manual of Metaphysics, may also be consulted.

Or

(b) Indian Philosophy.

Introduction to Indian Philosophy.

I. The Schools of Indian Philosophy. The common characters of Indian Philosophy.

II. The Charavaka Philosophy. Theory of knowledge. Materialism. Non-existence of Self and God.

III. The Nyaya- Vaisesika Philosophy. Theory of Knowledge. The nature of the world, Self and God. The Categories. Atomism.

IV. The Sankhya—Yoga Philosophy. Prakriti and the Gunas, Evolution of Prakriti, Purusa. Plurality of Purusas. Atheism. The place of God in the Yoga system. The nature and forms of Yoga

V. The Upanishads. Brahman and the Cosmic Ideal and the Acosmic Ideal.

VI. The Vedanta, Advaitavada of Sankara. Brahman. Maya. Isvara. Jiva. The World Appearance.

Visistadvaitavada of Ramanuja. Isvara. Prakriti. The World. Books recommended for consultation (relevant chapter):—

S. C. CHATTERJI and D. M. DATTA : An Introduction to Indian Philosophy (Calcutta University).

### ECONOMICS

There will be *two* papers. About half the total marks shall be allotted in each paper to general principles of Economics and the remainder to facts to Indian economic life. The following syllabus is prescribed :—

Paper I.

1. *Introductory*. Subject matter. Economics as a Science and an Art. Relation to other sciences. Its divisions.

2. *Methods.* Deductive and Inductive. Nature of economic law.

3. *Definitions :* e. g. utility, wealth, capital, income, production, consumption value, money.

4. *Production.*—The factors of production—land, labour, capital and organization (management and enterprise). Natural resources and human knowledge to use them. Natural resources—agricultural, mineral, geographical, power.

5. *Land.*—Factors affecting its productivity, Physical features of India. The Indian monsoons. Division of soils.

6. *Product of Indian Land.*—Agricultural products and their distribution. Minerals and their distribution. Forest products. Possibilities of water-power.

7. *Rural Economics.*—Different land tenures. Zamindari and ryotwari systems. Permanent and temporary settlements, merits and defects of each. Consolidation of agricultural holding. Factors affecting agricultural improvement in India.

8. *Labour*—Factors determining its efficiency, Malthus theory of population, positive and preventive checks. Health and strength of the population : its character and training.

*Indian labour.*—Occupation, efficiency, capacity and scope for training. Density of population. Its causes, Migration. Health and vital statistics. Standard of living. Effect of social customs.

9. *Capital.*—Harmonics and conflicts of labour and capital. Conditions affecting the growth of capital. Fixed and circulating capital. Advantages of machinery.

*Indian Capital.*—Agricultural capital, Roads, Railways—development, management, economic effects. Water transport. Irrigation, varieties, Government works, water rates.

10. *Organization.*—Distinction from labour, Function, Division of labour : meaning, advantages, disadvantages, limited by the extent of the market. Localization of industries : causes, advantages, disadvantages. Territorial division of labour.

*The Law of productivity*—Combination of the factors of production. The law of substitution. The laws of diminishing, increasing and constant returns with curves. Their operation in agricultural and manufacturing industries. Factors affecting the operation of the Law of diminishing returns.

*The scale of production.*—Large and small scale, advantages of each.

5. *Money*.—Definitions, characteristics, functions, special suitability of the precious metals, legal tender, full and limited. Free coinage. Standards of money, the quantity theory of money. Other factors affecting the level of prices. Appreciation and depreciation. Inflation and deflation, their effects. Index numbers: Objects, construction, weighing defects. Gresham's law and its limitations. Bi-metallism: meaning, operation in limited and wide areas. Law of compensatory action. Paper money: convertible and inconvertible, covered and fiduciary. Indian Paper currency.

6. *Credit*.—Postponement of payment and risk. Bills of exchange in retail and wholesale trade. Discounting and endorsing a bill. Credit and capital. Effect of credit on production.

*Banking*.—Functions. Discounts. Book credit. Bank's balance-sheet. Money market. The Clearing House System: purpose, working, advantages.

7. *Systems of Banking*.—The United kingdom: the Bank of England. Banking and currency theories. The Bank Charter Act of 1844 (as amended in 1928) India: The imperial bank, the joint stock banks, the exchange banks, the Government Treasury system, indigenous banking, co-operative banks, savings banks. Defects in Indian credit organization. Central Reserve Bank.

## Paper II.

1. *Exchange*.—Origin. Sale and purchase. Barter difficulties, gain of exchange.

*Market*.—Definition. Place and time markets. Causes of extension of markets. Time markets; daily, short, long and secular.

*Balancing of demand and supply*.—General theory of desire and aversion: their measurement. Laws of variation, law of utility, law of disutility, law of efficiency. Conditions of exchange: two sided monopoly, one sided monopoly or competition, two sided competition. Theory of value: utility and cost of Production. Limits of variation in exchange value. Operation of the force of demand and supply upon exchange value in the daily, short period, long period and secular markets.

*Speculation*.—Dealings in future. Relations between present and future prices. The stock exchange; investors, jobbers, bulls and bears. Effect of speculation in steadying prices.

Joint demand and supply. Alternative demand and supply. Derived demand. Condition in which check to the supply of one factor in joint demand may raise its price.

2. *Monopoly*.—Meaning, kinds of monopoly, kartel, trust, vertical combinations, Classifications of monopolies, Causes of industrial combinations. Law of monopoly revenue. Effects on monopoly revenue of elastic and inelastic demand and of co-operation of the law of productivity. Class price and use price. Advantages and disadvantages of monopoly. Control of monopolies.

3. *International trade*.—Difference from internal trade. Mobility of the factors of production. Law of comparative cost. Advantages and disadvantages of international trade. International value: limits of variation fixed by the difference in comparative costs. Favourable and adverse balance of trade. Equation of indebtedness, meaning, factors affecting it. India's balance of trade, important items of foreign trade, important countries of export and import.

4. *Free trade and protection*.—Meaning of each. Arguments for and against. Meanings of encouraging Indian industries. Conditions in which protection may be desirable. Fair trades. Countervailing duties. Reciprocity. Imperial preference.

5. *Money*.—Definitions, characteristics, functions, special suitability of the precious metals, legal tender, full and limited. Free coinage. Standards of money, the quantity theory of money. Other factors affecting the level of prices. Appreciation and depreciation. Inflation and deflation, their effects. Index numbers: Objects, construction, weighing defects. Gresham's law and its limitations. Bi-metallism: meaning, operation in limited and wide areas. Law of compensatory action. Paper money: convertible and inconvertible, covered and fiduciary. Indian Paper currency.

6. *Credit*.—Postponement of payment and risk. Bills of exchange in retail and wholesale trade. Discounting and endorsing a bill. Credit and capital. Effect of credit on production.

*Banking*.—Functions. Discounts. Book credit. Bank's balance-sheet. Money market. The Clearing House System: purpose, working, advantages.

7. *Systems of Banking*.—The United kingdom: the Bank of England. Banking and currency theories. The Bank Charter Act of 1844 (as amended in 1928) India: The imperial bank, the joint stock banks, the exchange banks, the Government Treasury system, indigenous banking, co-operative banks, savings banks. Defects in Indian credit organization. Central Reserve Bank.

8. *Foreign Exchange*.—Meaning. Foreign bills of exchange, drawer, acceptor, currency in which payable. Their supply and demand, consequent effect on the exchange rate. Specie points. Factors affecting the demand and supply of bills; trade, stock exchange, and banking. Par of Exchange: mint par. Correctives to the exchange rate.

9. *The Indian Currency*.—Short history up to 1893. Measures taken in 1893 and 1899. The Gold Exchange Standard: Machinery of maintaining the rate. Effects of a rise or fall in the price of silver. Measures taken in 1919 and 1927. Effects—temporary and permanent of a rise and fall of the rate of exchange upon trade and production. Summary of the measures recommended by the Currency Commission of 1926 (brief outline of proposals regarding the rate, the gold bullion standard and the Central Reserve bank).

10. *Consumption*.—Distinction from destruction, saving and hoarding. Kinds of human wants, their limitations and

variety. Law of consumption, classifications of consumption into necessities, comforts and luxuries and of necessities into bare efficiency and conventional necessities. Efficiency as the basis of classification. Variation of classification according to time, place individual and the unit of consumption.

11. *Measurement of Wants*.—Law of diminishing utility or satiable wants. Factors modifying the operation of the law. Marginal and total utility. Law of equimarginal utility. Law of demand. Elasticity of demand. Factors affecting the elasticity of demand, Consumers' surplus; definition, measurement, Engle's law of consumption. Methods of spending and prices in relation to satisfaction. Relation of spending and savings. Reaction of consumption on production, Economic waste.

12. *Public Finance*.—Difference between public and private expenditure. Public expenditure and functions of Government. Theory of maximum social advantage. Brief summary of sources of State income and of public debt.

13. *Taxation*.—Definition and characteristic of a tax. The tax system. Canons of taxation. Direct and indirect taxation. Incidence of taxation. Taxes and Monopolies. Shifting of a tax.

14. *Indian Finance*.—Peculiarities of Indian Finance; Home charges, capital expenditure; exchange operations, agricultural seasons. Brief summary of expenditure and public debt. Main sources of Imperial and Provincial revenue. Outline of the present system of land revenue, income-tax, customs, salt and railway revenue.

15. Causes of variation in national wealth and progress. Books recommended—

THOMAS : Elements of Economics.

P. BASU : Principles of Economics.

N. L. BHATNAGAR : Elements of Economics.

F. BENHAM : Economics (Pitman).

The Indian Year Book.

R. N. MATHUR : Money Exchange and Banking in India.

S. S. SAXENA and P. N. MATHUR : Reading in Indian Economics, Vols. I and II (Gautam Bros. & Co.)

## HISTORY

There will be *two* papers—

Paper I.—General History of Modern Europe from 1648 to 1914.

ACTON : Lectures on Modern History.

HAYES : A Social and Cultural History of Europe,  
Vol. I.

HAZEN : Modern European History.

European History Atlas (Denoyer Grappert Co.,  
Chicago).

FERDINAND SCHEVILL : A History of Europe (George  
Bell)

Note.—Questions on English History should not be compulsory.

Paper II.—A Period of Indian History :

*Either*

(a) Ancient India up to 1200 A. D.

V. A. SMITH : Early History of India (edited by  
Edwardes).

R. C. MAJUMDAR : Ancient Indian History and Civilization.

Greater India Society's Bulletins on India and China,  
India and Central Asia and Java and Sumatra  
(Part I).

R. D. BANERJI : Pre-Historic, Ancient and Hindu  
India.

*Or*

(b) Mediæval India, 1000—1707 A. D.

FOSTER : Early Travels in India

ISHWARI PRASAD : Muslim Rule in India (Book II  
only).

ISHWARI PRASAD : History of Mediæval India.

AIYANGAR : South India and her Mohammedan  
Invaders.

J. N. SARKAR : Mughal Administration.

EDWARDES AND GARRETT : Mughal Rule in India  
(Part II only).

DUTTA and SARKAR : A Text-book of Modern Indian,  
History. Vol. I Parts 1 to 3.

*Or*

(c) Rise and Establishment of British Dominion in India,  
1740—1919 (including Administration).



LYALL : Rise and Expansion of British Dominion in India.

RAMSAY MUIR : Making of British India.

SINDHIA : Rulers of India Series

RANJIT SINGH : Rulers of India Series.

DODWELL : Indian History after 1857 A. D

Simon Commission Report, Vol. I.

DUTT and SARKAR : Text-book of Modern Indian History (relevant parts).

### POLITICAL SCIENCE

There will be *two* papers—

Paper I.—Political Theory.

Nature and scope of Political Science.

Theories of the origin and nature of the State.

The classification of States.

Functions of the State.

Political conception—Liberty, Equality, Rights, Citizenship, Public opinion, Sovereignty, Nationality, Imperialism and Internationalism.

Modern Political Theories—Utilitarianism, Idealism, Individualism, Collectivism, Guild Socialism, Syndicalism, Anarchism, Communism, Pluralism, Fascism.

Development of the State.

Forms of Government

The structure of the State.

Books recommended—

JOAD : Modern Political Theory.

ASIRVATHAM : Political Theory.

J. P. SUDA : Elements of Political Science.

COLE : Guide to Modern Politics.

GARNER : Political Science and Government.

Paper II.—*Either*

(a) Constitutions—

(i) Detailed study of the Indian Constitution and

(ii) Outline study of the Constitutions of England, U S. A., France, Switzerland and Soviet Russia.

Books recommended—

MUNRO : Government of Europe.

RAM and SHARMA : Modern Governments.

G. N. JOSHI : New Constitution of India

K. T. SHAH : Provincial Autonomy (Revised edn.)

K. T. SHAH : Federal Structure

Or

(b) A study of the Constitutions of Great Britain, India and the Dominions, including a study of the Constitutional Organisation of the British Empire.

Books recommended—

SYDNEY LOW : Governance of England.

RAMSAY MUIR : How Britain is governed.

The Government of India Act of 1935.

ZIMMERN : The Third British Empire.

KEITH : Governments of the British Empire.

K. T. SHAH : Federal Structure.

K. T. SHAH : Provincial Autonomy.

SHARMA and VARMA : Government of India.

### GEOGRAPHY

There will be *two* papers—

Paper I —

(a) *Physical Basis of Geography.*

A broad knowledge of the physical geography of the world, including knowledge of elementary geology, sufficient for the correct appreciation of geographical phenomena.

The earth as a planet : its movements and relation to the sun ; the consequent distribution and seasonal variation of the insolation over the Earth's surface.

The atmosphere : distribution and periodic variation of the pressure and temperature of the air, of air movements and wind systems of humidity and precipitation ; climatic types and regions.

The oceans : the form of sea and ocean beds ; temperature and salinity of oceans and seas, waves and tidal movements and their effects, origin and effects of ocean circulation.

The lithosphere : general classification of the materials of the earth's crust ; sedimentary, igneous and metamorphic rocks ; earth movements and vulcanism ; processes of denudation and deposition ; the normal cycle of erosion and its principal interruptions ; development of river systems ; chief effects of glaciation ; principal types of landscape.

(b) *Human Geography.*

Contents and aims of human geography, the scope and

interpretation of racial, social, economic and political aspects of human Geography, its place among social sciences

Man and his environment.

Growth of Population.

Human establishments.

Man's relation to Vegetation, animals and minerals.

Sources of Power—Coal, Petroleum and Water.

Chief means of Transportation.

Life in Principal Geographical Regions.

(c) *Practical Work.*

Representation and interpretation by maps and diagrams of principal Land-forms and their development. Candidates will be expected to be familiar with Survey maps of India.

Elementary surveying, including the use of the prismatic compass, plane table and chain.

Principles of the following map projections ; their defects and suitability for particular purposes :—

Conical with one or two standard parallels, Bonne, International, Sinusoidal, Mollwerde, Mercator, Zenithal equidistant and Zenithal equiarea.

Construction and interpretation of weather and climatic maps. The cartographic and diagrammatic representation of geographical data.

Note.—There will be no practical examination, but questions referring to practical work will be included in the theory paper.

Books recommended—

(a) SALISBURY : Physiography.

DUBEY : Physical basis of Geography.

GREGORY : Geography. Structural, Physical and Comparative.

GREGORY : The Making of the Earth.

MURRAY : The Oceans.

TARR and MARTIN : College Physiography.

(b) VIDAL DELA BLANCHE : Principles of Human Geography.

HUNTINGTON and CUSHING : Principles of Human Geography.

(c) JAMESON and ORMSBY : Mathematical Geography. Part I

BYGOTT : An Introduction to Map Work and Practical Geography.

One inch, half inch and quarter inch Topographical Maps of the Survey of India.

Indian Daily Weather Report.

Paper II. —

A. Geography of Europe or Asia

B. India in detail.

Books recommended—

BLANCHARD and VISIER : Economic Geography of Europe.

LYDE . Europe

SHACKLETON : Europe.

LYDE : Asia.

STAMP : Asia.

BERGSMARK : Economic Geography of Asia.

Indian Year Book.

### DRAWING AND PAINTING

There will be *three* papers.

Paper I.—*Object and figure Drawing—*

(a) Drawing human head and also full figure from a cast (in Black and White).

Or

(b) Painting a group of still life objects (such as flowers, fruits, vegetables, utensils and objects of decoration and beauty) in black and white pastels, oil or water colours.

Paper II.—*Design and Nature Study—*

(a) Either a design or pattern on a graph paper prepared for a specified purpose, or a pictorial composition illustrating one of the historical, mythological and lyrical subjects, bringing in at least two figures, (including human, animal or bird), prepared in outline drawing, black and white, colour wash or tempera.

Or

(b) A simple landscape ( in black and white, pastel or water colour) with an elementary knowledge of parallel and angular perspective.

Paper III.—*Traditional Art and Art Appreciation—*

(a) Copy from old masters, viz. Ajanta, Bagh, Moghal, Rajput and modern schools.

Or

(b) Appreciation of Art with regard to elementary knowledge of the canons, conventions, styles, defferencia<sup>ti</sup> n.

and historical development of different schools of Indian Painting.

*Note — a) Questions will be set on all the alternatives of the three papers.*

*(b) Students will be given the choice of answering questions in paper III (b) in Hindi, Urdu or English.*

Books recommended—

PERCY BROWN : Indian Painting.

A. N. TAGORE : Indian Artistic Anatomy.

M. K. VERMA : Geometrical Drawing.

A. K. HALDAR : Art and Tradition.

KANHAIYA LAL VAKIL : Ajanta.

E. B. HAVELL : Hand-book of Indian Art.

## SOCIOLOGY

There will be two papers :—

Paper I.—Principles of Sociology.

Nature and scope. Definition, Divisions. Methods of study. Relation with biology, history, psychology, anthropology, ethnology, economics, ethics and politics.

Theory of evolution in relation to man

Growth of society : zoogenic, ethnogenic, and demogenic. associations. A brief survey of civilizations.

Factors in the growth of social organisations : (a) Geographical.....climate and natural resources as determining fundamental occupations ; (b) biological... ..nutrition and reproduction, heredity and environment ; (c) psychological ; (d) aesthetic ; (e) ethical ; (f) religious and (g) historical.

Types of social organisation : (a) Family.....matriarchal and patriarchal ; (b) horde, clan, tribe, caste, race, nation ; (c) political.....city state, country state, empire, federation, nationalism ; (d) economic, slavery, feudalism, industrialism, communism ; (e) religious - .....monastic orders ; (f) social.....clubs, associations ; (g) educational.....school, college, university.

Social pathology : (a) poverty and the problem of charity ; (b) diseases and sanitation, sterility and sterilisation ; (c) crime .....prisons and Borstals ; (d) over population and birth control ; (e) abuse of nationalism and wars ; (f) colour or problems, social laws and social justice.

.....their nature and sociological importance.

Role of concepts of suggestion, imitation, sympathy and intellect in social life.

Psychology of the moral, the economic and the religious life.

Definition of Crowd. Causes of its formation. Crowd behaviour.....its intellectual and emotional characteristics. Crowd as distinguished from organised group.

Books recommended for study—

GIDDINGS : Principles of Sociology.

BLACKMAR and GILLIN : Outlines of Sociology.

ROSS : Outlines of sociology.

BUSHEE : Principles of Sociology.

ELLWOOD : Social Psychology.

MUKARJE and SEN GUPTA : Social Psychology.

Books for reference :

HADDON : Races of Man.

KEANE : Man.....Past and Present

HUTCHINSON : Living Races of Mankind.

HAYES : Sociology .....New York.

GINSBERG : Psychology of Society.

MCDUGALL : Group Mind.

RIVERS : Social Organisation.

TAYLOR : Anthropology.

Paper II.—Indian Social Institutions.

General characteristics of Hindu social organisation : Caste : its different aspects.....economic, racial, ethical, religious, social ; different theories of caste ; critical survey of its effects on history of India ; distinction between caste and class ; its influence on non-Hindus in India ; influence of British administration and law on caste.

Hindu joint family ; its original advantages ; its present effects ; distinction between family, joint family, and coparcenary ; its legal implications ; right to partition ; legal position of woman in joint family.

Hindu marriage ; its varieties, *anumola* and *pratiloma* ; general problem of inter-caste marriage and its history ; significance of *gotra* ; endogamy and exogamy ; legal and social implications of *Stridhan* ; infant marriage.....its effects, its present position ; prohibition of widow marriage.....its legal and social effects ; problem of divorce ; marriage customs, polygamy ; relation of Hindu social institutions and Hindu religion ; question of introducing reforms by legislation.

Muslim family ; marriage as contract ; divorce ; legal status of woman ; purdah.....its original significance, its vogue in India and other Islamic countries ; its effects.

Indian village organisation ; importance of village in Indian society : the ancient village.....its organisation : the village *sabha* ..... its relation to central government ; effect of British administration on the village organisation ; villages in present India.....their condition now, their economic life ; revival of village *panchayats*.....how far successful ; village problems of the present day.

Races in India ; older views.....their criticism ; re-classification. Racial history of India. Cultural stages in India. Primitive life in modern India.

Books recommended for study :

Census of India report (relevant portions).

Imperial Gazetteer of India, Vol. I, Chapter VI

RISLEY : Peoples of India.

O. MALLEY : India's Social Heritage.

BLUNT : The Caste System of Northern India .

Books for reference :

DUDLEY STAMP : Asia.

NANAVATI : Indian Rural Problem.

P. K. WATTAL : Population Problem in India.

W. C. Smith : Modern Islam in India.

GHURYE : Race and Caste in India.

## INDIAN MUSIC

### A.—Vocal.

(1) Evolution of Scale (ii) Jati (iii) Definition and Lakshana of Raga (iv) Thata and classification of Ragas under the Thatas (v) Asraya raga ; Purva raga ; Uttara raga ; Sandhi Prakasha raga ; Guna-dosa of the musicians ; Suddha, Chayalaga and Sankirna ragas ; Graha, Ansa and Vyasa ; svaras ; Sruti and Svara Sthanas ; Gita ; Gendharva and Gana ; Ragalapa ; Bahutava and Alpatva ; Rupakatapa ; Alapti ; Avirobhava and Tirobhava ; Sthaya ; modern Alapa Gayana ; Tana ; Doltana ; Vaggeyakara ; Prabhandha ; Dhruvapada ; Khyala ; Tappa ; Thumari, Dhamara ; Hori ; Tarrana ; Chaturanga ; Trivata ; History of Indian Music ; Distinction between Indian and European scale ; Distinction between Melody and Harmony ; Difference between the Hindustani and Karnatic systems of Tala.

## Practical.

One Bara Khyal ; One Chota Khyal or Tarrana or Chaturanga or Bhajan in the following ragas :—

Kalingada ; Sri-raga ; Sohani ; Suddha Kalyana ; Kamoda ; Chayanata ; Hindol ; Ramakali ; Paraja ; Puriya ; Lalita ; Gauda-Malhara ; Miyan-Malhara ; Adanal Bhairava-Bahar.

In addition to the above ragas, a knowledge of the following ragas as prescribed for the High School and Intermediate Boards of U. P. and Ajmer will also be required :—

Bilavala ; Khamaja ; Yamana ; Kafi ; Asavari, Bhairavi, Behaga ; Desai ; Bhimpalasi. Bhupali, Vrindavani-sarang ; Bhairava ; Vagisvari ; Hamira ; Pilu ; Kedara ; Tilak-Kamoda ; Puravi ; Marava ; Todi ; Malakosa . Durga ; Kanada ; Jayjayavanti ; Bahara ; Multani ; Vasant ; Gauda-Saranga ; Sankara ; Desakara ; Puriya ; Dhanasri ; Jaunpuri.

The candidates will also be required to learn at least 5 Dhrupada and 5 Dhamars in different ragas out of the above syllabus.

Tala.—The candidate must possess a knowledge of the following Talas :—

Tritala ; Panjabi Theka , Tilwada ; Dadara ; Jhaptala ; Jhumara ; Ada Chautala ; Chautala ; Ekatala ; Sulphaka ; Dhamara ; Tivra ; Rupaka .  
Dipachandi (Chanchar) and Kharava

## B.—Instrumental.

The following in addition to the Syllabus prescribed for Theory in Vocal Music :—

Gata ; Jhala ; Ghasita ; Joda ; Parana ; Zamzama.

Evolution of Sitar and Tabla.

practical.

One of the following instruments is prescribed for the practical test :—

Vina ; Sarangi ; Esraja ; Sitar ; Violin ; Sarod ,  
Pakhavaj ; Tabala.

The candidates must possess a general knowledge of the Ragas prescribed for vocal music, but special attention must be paid to the Ragas mentioned below. He must know Saragams ; alapas (Joda) gat ; Todas, etc., in these ragas.

1 Bhimpalasi ; Bhupali ; Bhairava ; Bhairavi ; Kafi ; Behaga ; Desai ; Tilaka-Kamoda ; Vagisvari ; Asavari ; Pilu ; Kanada ; Todi ; Yamana ; Puriya ; Malakosa.

In Pakhavaja or Tabla, candidates must possess a practi-



cal knowledge of the Thekas, Mukhada and at least a dozen Paranas, Relas, etc., and their Tihais in all the talas given above.

The candidate must know the system of tuning the instrument he/she offers and must be able to effect simple repairs.

**Books recommended.**

- 1 V. N. BHATKHANDE : Hindustani Sangit Kramika Series, Parts I—IV Published by. V. S. Sukathankar. Solicitor, Malabar Hills, Bombay 2.
  - 2 RAJA NAWAB ALI : Selections from Mûarful-naghmat, Bhatkhande University, Lucknow).
  - 3 KRISHNADHAN BANERJI : Gita-Sutra-Sura.
  - 4 GOPESHWAR BANERJI : Sangit-Chandrika
  - 5 V. N. PATWARDHAN : Raga-vijanana (Gandharya Maha Vidyalaya, Poona)
  - 6 HAMID HUSSAIN : Talim-Sitar (Marris College of Music, Lucknow)
  - 7 S. P. BANERJI : Si:aramarga (Marris College, of Music Lucknow).
  - 8 Shāstra-Pravasha, Parts II-IV.
  - 9 V. N. BHATKHANDE : A short Historical Survey of the Music of Upper India (University, Lucknow).
  - 10 S. N. RATANJANKAR : Tan-Sangraha Parts I and II (Marris College of Music, Lucknow)
  - 11 MR S. ATIYA BEGUM : Sangit of India (Villa Atiya, Ridgewood, Bombay).
  - 12 G. S. RANADE : Hindustani Music-its Physics and Aesthetics (Willingdon College, Bombay).
  - 13 RAJA BHAIYA POCCHWALE : Tana-Malika, Parts I, II, and IV (Madhava Sangita Vidyalaya, Gwalior).
  - 14 SAKHARAM : Tabala-Sikṣa-
  - 15 GOVIND RAO GURU : Mridang-Tabla-Vadana-Subodha. Parts I and II. (Burhanpur, C P.)
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## M. A. EXAMINATION

### ENGLISH LITERATURE

#### PREVIOUS.

(For the Examination of 1948)

There will be four papers.

**Paper I.**—English Poetry from 1798 to the present day.

*Prescribed Texts : (a) For Detailed study—*

WORDSWORTH : Selected Poems edited by Matthew Arnold (Macmillan's Golden Treasury Series).

KEATS : Odes.

SHELLEY : Adonais.

BYRON : Childe Harold, Canto III.

TENNYSON : In Memoriam.

The Golden Treasury of Modern Lyrics, Book II  
(edited by Binyon).

*(b) For General study—*

BROWNING : Selections by Young.

MORRIS : The Defence of Guenevere and other  
Poems, including the Life and Death of Jason,  
(World's Classics Edition).

D. G. ROSSETTI : The blessed Damozel.

**Paper II.**—The Drama, with special reference to Shakespeare.

*Prescribed Texts : (a) For detailed study—*

SHAKESPEARE : As You Like it, Richard II, The  
Tempest, King Lear.

BEN JONSON : Every man in His Humour.

SHERIDAN : The School for Scandal.

**Note.**—Candidates will be expected to show first-hand acquaintance with all the principal plays of Shakespeare.

*(b) For general study—*

MARLOWE : Edward II.

MILTON : Samson Agonistes.

BERNARD SHAW : Candida.

GALSWORTHY : Strife.

**Paper III.**—English Poetry from 1580 to 1800.

*(a) Prescribed Texts—*

MILTON : Paradise Lost, Books I and II.

POPE : The Essays on Criticism.

N. SMITH : The Oxford Book of Eighteenth Century Verse (Poems of Thomson, Collins, Gray and Cowper).

(b) *For general study*—

W. T. YOUNG : An Anthology of the Poetry of the Age of Shakespeare (Cambridge University Press).

Paper IV.—English Prose from 1580 to 1800.

*Prescribed Texts : (a) For detailed Study*—

SIDNEY : Apologie for Poetrie.

BACON : Essays, I to X. The following Essays :—

Of study, Of Discourse, Of Ceremonies and Respects, Of Followers and Friends, Of Suitors, Of Expense, Of Regiment of Health, Of Honour and Reputation, Of Faction, Of Negotiating.

BROWNE : Hydriotaphia Chapters IV & V.

MILTON : Areopagitica.

ADDISON : Essanys (edited by Fowler, English Literature Series Macmillan).

JOHNSON : The Preface to Shakespeare, annotated by J. K. Macphal [Oxford University Press].

*Books recommended for general reading*—

Paper I.

WARD : English Poets, Vols. IV and V.

SAINTSBURY : Nineteenth Century Literature (Macmillan).

HUGH WALKER : The Literature of the Victorian Era [Cambridge University Press].

Paper II.

A. NICOLL : Theory of Drama [Harrap].

A. W. WARD : English Dramatic Literature.

BRADLEY : Shakespearean Tragedy.

RALEIGH : Shakespeare [E. M. L.]

HERFORD : Outlines of Recent Shakespearean Investigation.

RALLI : A History of Shakespearean Criticism.

SCHELLING : The English Drama [Channels of Literature Series].

Paper III.

O. ELTON : The Augustan Ages [Blackwood].

H. J. C. GRIERSON : The First Half of the Seventeenth Century [Blackwood].

C. E. VAUGHAN : The Romantic Revolt.

PHELPS : Beginnings of the Romantic Movement.

WARD : English Poets, Vols. II and III.

**Paper IV.**

CRAIK : English Prose Selections, Vol. IV.

GOSSE : Eighteenth Century Literature.

A. H. BULLEN : The Elizabethans [Chapman and Hall].

RALEIGH : Six Essays on Johnson.

**FINAL.**

*(For the Examination of 1949).*

There will be *four* papers and a *viva voce* test.

**Paper I.**—History of English Literature from 1350 to 1914, including questions on the History and Principles of Criticism. Candidates will be expected to show first-hand knowledge of the principal works of representative authors.

**Paper II.**—Early Poetry from Chaucer to Spenser, including an elementary study of Middle English Grammar.

*Prescribed Texts (a) For detailed study—*

CHAUCER : Prologue to the Canterbury Tales; and the Nonne Priestes Tale.

LANGLAND : Prologue to Piers Plowman.

SPENSER : The Færie Queene, Book I.

*(b) For general study—*

SKEAT : Specimens of the English Literature from 1394—1579.

**Paper III.**—English Prose from 1800 to the present day.

*Prescribed Texts : (a) For detailed study—*

MATTHEW ARNOLD : Essay in Criticism, Second Series, omitting the essay on Amiel

English Critical Essays, XX Century [The World's Classics]. [O. U. P.] The Essays by Robert Bridges, George Saintsbury, Alice Meynell, A. C. Bradley, Sir E. K. Chambers, J. A. Chapman, Lascelles, Abercrombie and Middleton Murry.

HAZLITT : Selection from kings Treasuries Series (Macmillan)

*[b] For general study—*

The Novel, with special reference to—

SCOTT : Old Mortality.

THACKERAY : Vanity Fair.

MEREDITH : The Ordeal of Richard Feverele.

HARDY : Tess of the D'Urbervilles.

JOSEPH CONRAD : Lord Jim.  
 Paper IV.—An Essay on a literary subject.  
*Books recommended for General reading—*

Paper I.  
 The Cambridge History of English Literature.  
 Channels of English Literature Series.  
 Handbooks of English Literature [The Age Series].  
 SAINTSBURY : History of English Criticism.  
 SAINTSBURY : Loci Critici.  
 A. C. WARD : Twentieth Century Literature.  
 LEGOUIS and CAZAMIAN : History of English Literature.  
 SCOTT JAMES : Making of Literature [Benn].  
 WORSFOLD : The Principles of Criticism. [George  
 Allen & Unwin, Ltd., London].  
 SHIPLEY : The Quest of Literature [Published by  
 Richard R. Smith, New York].  
 VAUGHAN : English Literary Criticism [Blackie and  
 Sons].

Paper II.  
 E. LEGOUIS : Chaucer [Dent].  
 W. P. KER : Mediæval English Literature.  
 CHURCH : Spenser [Macmillan].

Paper III.  
 RALEIGH : History of the English Novel.  
 E. A. BAKER : The History of the English Novel.  
 SAINTSBURY : The English Novel [Dent].  
 HUGH WALKER : The English Essay and Essayists  
 [Dent].  
 O. ELTON : Survey of English Literature, 1830—  
 1880, Vols. I and II.

### ARABIC

(For the Previous and Final Examinations of 1949).  
 Note.—Arabic words must be written in Arabic character.

There shall be eight papers, four for the Previous and four for the Final. Paper VII (Translation) must be offered in the Previous, and Paper VIII (Essay) in the Final. Out of the other six a candidate may select any three for the Previous and the other three for the Final.

Paper I.—Classical Prose—

(1) مقامات حبيبى ten maqamat

(11) انوار امله شبه

(iii) كليله دمله

Paper II.—Classical Poetry.

(i) (أ) لماراثي and باب الحماسة — ديوان الحماسة

(ii) العلقات السبعة

Paper III.—Literary Criticism.

(i) ابن قتيبة by كتاب الإعازف

(ii) الغصوى

Paper IV.—History of Arabic Literature ; Haart or Nicholson

Paper V and VI.—Any two of the following :—

(a) Mysticism—Selections from رساله قشهرية and

(b) Commentary on the Quran—Selections  
احياء العلوم

from وشاف or بوضارى or جمع لجوامع طببرى

(c) Text Hadith with the Allied Lughat either

استبصار or مجمع البحار with the help of  
صحيح مسلم  
with the help of مجمع البحرين

(d) Logic and Metaphysics

(قاضي مبارك صدر احمد الله)

(e) Comparative Philology of Semitic Languages : O' Leary's Comparative Grammar of Semitic Languages

(٢) منشور حضرت شاهنشاهی به حکیم ممام

(f) History of Islam (one specific period from

(أ) ثنين اكدوي or طببرى

Paper VII.—Translation from English into Arabic and vice versa.

Paper VIII.—Essay on a literary subject.

Note.—Critical questions shall be set in Papers I and II. A sound knowledge of Syntax, Prosody and Rhetoric shall be expected.

### PERSIAN

(For the Previous and Final Examinations of 1949).

Note.—Persian words must be written in Persian character.

There shall be *eight* papers, four for the Previous and four for the Final. Paper VIII (Essay) must be offered in the Final. Out of the other *seven*, a candidate may offer any *four* in the Previous and the other *three* in the Final.

Paper I.—Classical Prose,

(1) نثر دوم—ظہوری

(2) شبنم شاداب—تفرشی

Paper II.—Classical Poetry.

(1) انتخاب کلیات خاقانی published by Anwar-ul-Matabe Lucknow, omitting following Qasidas:—

(۱) ہر صبح پائے صبر بدامی در آرم

(۲) اے پنج نوبہ گوفتہ در دار ملک لا

(۳) صبح وارم کو کافتایے در نہاں آوردہ ام

(2) قصائد عرفی

The following Qasidas are prescribed:—

(۱) اے برزۂ دامن بلا را

(۲) سویدہ دم چو زدم آستہوں بہ شمع شعور

(۳) صبتدم چوں در دمد دل صور شہون زائے من

(۴) دسیکہ لشکر غم می کشد بختو نخواستاری

(۵) چہرہ یزداد جہاں رخت کشد چوں بکمل

(۶) ز آسمان و زمین مژدہ ناگہاں آمد

(۷) صباح عید کہ در تکیہ گاہ ناز و نعیم

(۸) این بار گاہ گیسست کہ گویند بے ہراس

(۹) ہز سوختہ چالے کہ بکشیو در آید

(۱۰) تو بہار آمد کہ افشاند بکسن یار گل

(3) انتخاب دیوان حکیم فرخی Published by Qaumi b Khana Lahore, the following Qasidas are ibed:—

(۱) برآمد نیلگون ابرے زروے نیلگون دریا—

(۲) ہمی تا خسرو غازی خداوند جہاں باشد

- (۳) یحیی دولت شاه زمانه با دل شاد  
 (۴) قوی کننده دین محمد مختار  
 (۵) فسانه گشت و کهن شد حدیث اسکندر—  
 (۶) اے ز جنگ آمده و روئے نموده بشکر—  
 (۷) سال و ماه نهک و روز خردم و فرخ بهار—  
 (۸) شهر غزنین نه همانست نه من دیدم بهار—  
 (۹) بدین خرمی جهان بدین نازگی بهار—

Paper III.—Sufistic Poetry.

- (1) مثنوی مولانا جلال الدین رومی (Selections published by Anwar-ul-Matabe, Lucknow).  
 (2) ردیف "د"—دیوان حافظ  
 (3) اسرار خودی by Allama Iqbal.  
 (4) مسی نگارم قصیده فردالدین عطار beginning with (Shah & Co. Hakim Wasi Road, Agra).

Paper IV.—Biographies

Biographical and critical study of Amir Khusraw.

Books recommended—

1. Pre-Mughal Persian in Hindustan by Prof. Shams-ul Ulama, M. A. Ghani, M. A., M. LITT. [Cantab].
2. Hazrat Amir Khusraw by Prof. Habib.
3. Sherul Ajam by Moulana Shibli, Parts II, IV and V.
4. Nigâristan-i-Fars by Azad.
5. Encyclopaedia of Islam : Article on Amir Khusraw.
6. Persian Portraits by Sir Gore Ouseley.
7. Khusraw by Dr. Wahid Mirza.

Paper V.—History of Persian Literature.

Section I : Pre-Ghaznavid from ninth century A. D. Ghaznavid, Seljuq, Mongol and early Timurid periods.

Or

Section II : Later Timurid, Safavid, Mughal and Qachar periods.

Books suggested—

E. G. BROWNE : History of Persian Literature, four volumes.



M. A. GHANI : History of Persian Language at the Mughal Court, three volumes.

MOHD. ISHAQUE : Modern Persian Poetry.

Note.—The question paper to contain questions on both the sections.

Paper VI.—Modern Prose and Poetry.

(1) Haji Baba Isphahani, edited by Shadan Bilgrami and published by Sh. Mubarak Ali, Bookseller, Inside Lahori Gate, Lahore—*از گفتار اول تا ختم گفتار دهم*

(2) *مرد خسیس* published by Sh. Mubarak Ali, Lahore.

(3) "ردیف الف و ب" انتخاب کلیات قآنی (published by Sheikh Mubarak Ali Lahore).

(4) *ادبیات ایران نو* (Qaumi Kutab Khana, Lahore).

Paper VII.—One of the following subjects selected by the head of the department in the beginning of the session.

(a) Mysticism.

۱—*کیسائے سعادت غزالی*—(۱) عنوان اول در شناختن خریشتن

(۲) عنوان دوم در شناختن حق

سبکسایه تعالی

(۳) عنوان سوم در معرفت دنیا

(۴) عنوان چهارم در معرفت آخرت

۲—*نفحات الانس جامی* :—

از تمهید فی القبول فی الولایتہ والولی تاشروع ذکر ابو حاشم الصوفی

الکلام فی تفصیل الاولیاء علی الاولیاء from کشف المحجوب (3)

ابراہیم فی الکلام در سگوت to the end of

(b) Politics and Civics

(1) تدویر منزل-اخلاق ناصری

(2) سیاست مدن-اخلاق جلالی

(c) Historical Literature :

[1] *Tarikh-i-Tabari*, Vol. IV, from the beginning to the end of Prophecy.

[2] Rauzatus-Safa, Vol. II, by Khawand Mir Harvi [Newul Kishore Press Edn.] from the beginning of the Caliphate [page 219 to the end, page 322].

(d) Literary Criticism,

Shibli : Sherul Ajam, Vols. I, II, III, IV and V.

Paper VIII.—Essay on a literary subject.

Note.—Critical questions will be set in Papers I, II, III and IV. A sound knowledge of Syntax, Prosody and Rhetoric shall be expected.

### SANSKRIT

(For the Previous and Final Examinations of 1949).

There will be eight papers as follows:—

I. Vedic Literature and Elements of Comparative Philology.

II. Classical Literature.

III. Indian Philosophy.

IV. Literary and Cultural History of Ancient India.

Either Group A.—Sanskrit Language and Literature.

V. Rhetorics and Prosody.

VI. Drama and Dramaturgy.

VII. Kavya and Grammar.

Or Group B.—Philosophy.

V. Nyaya and Vaisesika.

VI. Sankhya and Yoga.

VII. Vedanta and Mimamsa.

VIII. Sanskrit Composition and Translation from English into Sanskrit.

Paper VIII. Shall be offered in the Final year only. Candidates can offer any other *four* papers in the Previous and the remaning *three* papers in the Final Examination subject to the following restrictions:—

[1] Candidates offering one or more papers of Group A in the Previous shall have to offer Paper II as one of the four papers for the Previous Examination.

[2] Candidates offering one or more papers of Group B in the Previous shall have to offer Paper III as one of the four papers for the Previous Examination.

Paper I.—Vedic Literature and Elements of Comparative Philology.

(a) Vedic Literature.

PETERSON : Hymns from the Rigveda [Bombay Sanskrit Series No. XXXVI]. Hymns Nos. 2-8, 10, 12, 14, 19

20, 23, 24, 26, 28-30, 32-34.

(b) Elements of Comparative Philology

The outlines of scope, mechanism of speech, phonetic laws and classification of languages with special reference to the Indo-Aryan group.

Books recommended—

JAHAGIRDAR : An Introduction to the Comparative Philology of Indo-Aryan Languages. [Oriental Book Agency, Poona].

MANGAL DEVA SHASTRI: Tulanatmakā Bhasha Shastra  
Paper II.—Classical Literature.

MAGHA : Sisupalavadha, Cantos I and II.

BHAVABHUTI : Uttara-Ramacharita.

KALIDAS : Meghaduta

YAJNAVALKYA : Acaradhyaya, the following Prakāśanas :—

Upodghata, Brahmachari Vivaha, Grihasthadharma, Snatakadharma and Rajadharma.

Paper III.—Indian Philosophy.

Katha Upanishad with Shankarabhashya.

KESAVA MISRA : Tarkabhasha.

SADANANDA : Vedantasara.

Books recommended—only relevant portions.

BALDEVA UPADHYAYA : Bhartiya Darshan.

DR. HIRIYANA : Outlines of Indian Philosophy.

Paper IV.—Literary and Cultural History of Ancient India.

Books recommended—

WINTERNITZ : History of Indian Literature, Vol. I

KEITH : History of Sanskrit Literature.

MACDONELL : India's Past

R. K. MUKERJI : Hindu civilisation only chapters IV, V, VI and VII pages 296-319.

Cam. His. Vol. I only chapters II—X and XXVI.

Note.—Questions in this paper are to be confined to the topics dealt with in the books recommended.

Either GROUP A.—SANSKRIT LANGUAGE AND LITERATURE.

Paper V.—Rhetoric and Prosody.

(a) Rhetoric—

Kavyaprakasa.

Books recommended—

P. V. KANE : History of Alankara Literature.

S. K. DE : Sanskrit Poetics, Vol. II.

(b) Prosody—The following meters :—

आर्या श्रुतुदुप्, इन्द्रवज्रा, उपेन्द्रवज्रा, उपजाति, भुजङ्गप्रयात, हुतविलम्बित, वंशस्थ, प्रहर्षिणी, वसन्ततिलका, मालिनी, हरिणी, शिखरिणी, मन्दक्रान्ता, शार्दूलविक्रीडित, स्रग्धरा ।

Paper VI.—Drama and Dramaturgy.

(a) Drama.

Mricchakatika.

Ratnavali.

Venisamhara.

(b) Dramaturgy—

BHARATA : Nāṭyaśāstra, Chapters I and II .

DHĀNANJAYA : Dāśarupakam.

Paper VII.—Kavya and Grammar.

(a) Kavya—

Vikramāṅkadevacarita, Canto I.

(Saraswati Bhawan Text Series, Govt Sanskrit College, Benares).

Naishadha, Cantos I and II.

Kadambari, Purnabhaga, upto the end of Mahashveta Vrittanta.

(b) Grammar—

Siddhantakaumudi—Kāraka.

Laghukaumudi—Kridanta and Samasa.

Or Group B.—PHILOSOPHY.

Paper V.—Nyaya and Vaisheshika.

VATSYAYANA : Nyaya Sūtras with Bhashya, Chapter I.

VISVANATH : Nyaya Siddhantamuktavali, Pratyaksha and Shabda Khanda.

Prasastapadabhashya.

Recommended—

Tarkasangraha, edited by Bodas.

Paper VI.—Sankhya and Yoga.

VACHASPATI MISHRA : Sankhakatattvakaumudi.

BHOJA : Yogasūtravṛiti, Chapters I, II, III (only 1-15 Sūtras) and IV.

Paper VII.—Vedānta and Mīmāṃsā.

SANKARA : Brahmasūtra with Sarirakabhashya, Adhyaya I, Pada 1, Sūtras 1-4, and Adhyaya II, Padas 1 and 2.

Laugakshibaskara : Arthasamgraha. edited by D. V. Gokhale [Oriental Book Agency, Poona].

Paper VIII.—Sanskrit Composition and Translation from English to Sanskrit.

Books recommended—

MANGAL DEVA SHASTRI : Prabandha Prakasha.  
(Indian Press, Allahabad).

GIRIDHAR SHARMA : Nibandhadarsh.

Published by (Sharda Mandir, Nai Sarak, Delhi).

## HINDI

(For the Previous and Final Examinations 1949).

There shall be the following eight papers of which the Essay paper [Paper VIII] must be taken in the Final Examination and out of the remaining seven papers, any four may be taken in the Previous Examination and the other three may be taken in the Final Examination

Paper I.—Modern Text (Prose and Drama)

1. BHARTENDU HARISHCHANDRA : Chandravali Natika.
2. JAISHANKER PRASAD : Ajat Shatru.
3. PREM CHAND : Godan.
4. RAM CHANDRA SHUKLA : Chintamani (Essays Nos. 3, 5, 6, 11 to 16 only).
5. DR. S. K. LAL : Hindi Kahaniyan (published by Sahitya Bhawan, Ltd., Prayag).

Books recommended :—

1. SHIV NATH : Acharya Ram Chandra Shukla.  
(published by Saraswati Mandir, Benares)
2. S. N. SRIVASTAVA : Hindi Upanyas
3. DR. L. S. VARSHNEY : Adhunik Hindi Sahitya.
4. DR. S. K. LAL : Adhunik Hindi Sahitya ka Vikas.
5. BRAJ RATNA DAS : Hindi Natya Sahitya.

Paper II—Modern Poetry.

1. RATNAKAR : Udhava Shatak.
2. PRASAD : Kamayani चिन्ता, आशा, श्रद्धा, काम
3. MAITHILI SARAN : Yashodhara.
4. HARI AUDH : Vaideliivanavas.
5. PANT : Adhunik kavi II [Published by Hindi Sahitya Sammelan, Prayag].

Books recommended :

1. KRISHNA SHANKER SHUKLA : Kavivar Ratnakar  
[published by Vidya Bashkar Book Depot, Benares].

2. DR. K. N. SHUKLA : Adhunik Hindi Kavya Dhara  
[published by Saraswati Mandir, Benares].
3. GANGA PRASAD PANDEY : Kamayani-Ek-Parichaya,  
[published by Messrs. Ram Narayan Lal, Allahabad].

Paper III.—Mediaeval Texts.

BEHARI LAL : Satsai.

TULSI DAS : Vinayapatrika.

SENAPATI : Kavitta Ratnakar [Hindi Parishad,  
Allahabad University].

RAM CHANDRA SHUKLA : Bhramar Gita Sar.

Books recommended for general study—

DHIRENDRA VERMA : Ashta Chhap.

RAM KUMAR VERMA : Hindi Sahitya ka Alochna  
mak Itihas, Part I.

Paper IV.—Old Texts.

CHAND BARDAI : Prithviraj Raso [Padmavati Samaya]  
Ed. H. N. Tandan [Published by Shri Ram  
Mehra & Co. Agra].

SHYAM SUNDAR DAS : Kabir Granthawali.

Sakhies only. (N. P. Sabha, Kashi)

MALIK MUHAMMAD JAYASI : [Padmawat upto  
रत्नसेन संतति खण्ड] (N. P. Sabha, Kashi).

Beli Rukmani Krishna Ri. first 186 Padas only.

Books recommended for general study—

P. D. BARTH WAL : The Nirguna School of Hindi  
Poetry. (Indian Book Shop, Benares).

HAZARI PRASAD : Kabir (Hindi Granth Ratnakar  
Karyalaya, Bombay).

Paper V.—Principles of Criticism and History of Literature.

SHYAM SUNDAR DAS : Sahityalochan [Revised  
edition]

VISHWA NATH PRASAD MISRA : Vangmaya Vimarsha.  
(excluding the portions on Philology).  
[Hindi Sahitya Kutir, Benares].

H. P. DWIVEDI : Hindi Sahitya ki Bhumika. [Hindi  
Granth Ratnakar Karyalaya, Bombay].

SHYAM SUNDAR DAS : Hindi Bhasa aur Sahitya,  
[portion on Literature only].

RAM CHANDRA SHUKLA Hindi Sahitya ka Itihas.  
[Revised and enlarged edition].

RAM CHANDRA SHUKLA : Chintamani, Part II.

(Saraswati Mandir Jatanbar, Benares).

KANHAIYA LAL PODDAR : Alankar Manjari

KANHAIYA LAL PODDAR : Ras Manjari [Latest edn.]

Paper VI.—Comparative Philology and development of Hindi Language.

History of the Sciences, Language and its origin ; Classification of Languages ; Causes of Change in Language ; Phonetic changes ; Semantic changes ; Morphological Development of Language ; History of the Indo-Aryan Language with special reference to Hindi ; Development of Hindi, and Elements in the Vocabulary of Hindi.

Books recommended—

SHYAM SUNDAR DAS : Bhasha Vigyan (Revised edition).

BABU RAM SAXENA : Samanya Bhasha Vigyan (Hindi Sahitya Sammelan, Prayag..)

SHYAM SUNDAR DAS : Hindi Bhasha aur Sahitya ( Portion on language ).

DHIRENDRA VARMA : Hindi Bhasha ka Itihas.

( Hindustani Academy, U. P., Allahabad ).

RAM KRISHNA SHUKLA : Arya-Bhasha and Sanskriti.

Paper VII.—(a) A Subsidiary Modern Indian Language :

Or

(b) A Basic Language ;

Or

(c) Detailed and critical study of a special author or period.

(a)—Subsidiary Languages.

Urdu :—

CHAKBAST : Mazamin-i-Chakbast.

ALIAS BARNI : Musaddas-i Hali.

HALI : Muqaddama Shair-o- Shairi.

RAM BABU SAXENA : Tarikh-Adab Urdu, translated by Mirza Mohammad Askari, [Newul Kishore Press, Lucknow], Chapters I, II and III pp.1-57].

Marathi :—

R. KIRLOSKAR : Shakuntala.

N. N. APTE : Usha Kal.

N. KELKAR : Abhinava Kavyamala, Part IV.

G. G. AGARKAR : Nibandhamala, Part I.

Bengali :—

RABINDRA NATH TAGORE : Balaka.

BANKIM CHANDRA CHATTERJEE : Bish Briksha.  
HARA PRASAD SHASTRI : Bharat Mahila.  
D. L. ROY : Chandra Gupta.

(b)—Basic Languages.

*Sanskrit* :—

Raghuvansam, Canto VI.

V. ANANTACHAKYA : Chandrapidacharitam.

Shakuntalam, Act IV.

KALE : Smaller Grammar of Sanskrit.

RAM BEHARI LAL : Sanskrit Dwitiya Pustakam.

*Pali* :—N. V. TUNGAR : Jatak Sangrah (Oriental Book Agency, Poona).

ADYA DATTA THAKUR : Paliprabodh.

C. V. JOSHI : A Manual of Pali (Oriental Book Agency, Poona).

*Apabhramsa* :—

HEM CHANDRA : Vyakaran [Apabhramas portion only].

NAROTTAM DAS SWAMI : Apabhramsa Path Mala [Part 1], [Indian Press, Allahabad].

(c)—Detailed and critical study of a special author or period.

*Any one* of the following authors :—

Tulsi, Keshava, Sur, Bharatendu Harish Chandra and Jai Shankar Prasad.

Books recommended —

*Tulsi*

1. Tulsi Das by Dr. Mata Prasad Gupta.
2. Tulsi Darshan by Dr. B. P. Misra.
3. Goswami Tulsi Das by R. C. Shukla.

*Sur*

1. Sur Sahitya Ki Bhumika by R. R. Bhatnagar.
2. Sur Das by Pt. R. C. Shukla.
3. Sur Saurabha by Munshi Ram Sharma.

*Bharatendu Harishchandra*

1. Bharatendu Harishchandra by Brij Ratna Das.  
[Published by Hindustani Academy, Allahabad].
2. Bharatendu Yuga by Dr. Ram Bilas Sharma.
3. Bharatendu Ji Ki Bhasa aur Shaili by Gopal Lal Khanna.



*Jaishanar Prasad*

1. Prasad Ke Natakon Ka Shastriya Adhyayan by Dr. J. N. Prasad Sharma
2. Prasad Ki Kavya Sadhana by Ram Nath Lal Suman.
3. Prasad aur unka Sahitya by Vinod Shankar Vyas. [Published by Vidya Baskar Book Depot, Benares].

Paper VIII.—Essay on an advanced literary subject.

**URDU**

(For the Previous and Final Examinations of 1949).

There shall be the following *eight* papers of which the Essay paper and the paper on detailed and critical study of special author or period must be taken in the Final Examination, and out of the remaining *six* papers, any *four* may be taken in the Previous Examination and the other *two* in Final.

Paper I.—Modern Texts.

*Poetry—*

1. Qasaid Aziz Lucknavi (First five Qasidas).

- ۱ باقیات خانی مطبوعہ آگرہ اخبار پریس آگرہ
- ۲ دیوان شاقب از مرزا ثاقب تزلہاں لکھنوی
- ۳ شعلہ و شبنم از جوش میلج آبادی
- ۵ بال جبریل از ڈاکٹر اقبال
- ۶ حسرت موہانی مرتبہ عبدالشکور
- شائع کردہ شاہ ایفد کمپنی پبلشرز حکیم وصی روڈ آگرہ

*Prose—*

- ۱ مضامین (شور جلد چہارم) ادب و تحقیق مسایل
- ۲ مضامین مرزا فرحت اللہ بیگ دہلوی (حصہ اول)
- ۳ اقادات مہدی از مہدی حسین افادی
- ۴ کچھ ہنسی نہیں ہے—از علی عباس حسینی
- ۵ ترقی مہدی حاشیے از پروفیسر مجتہد گورکھپوری

The following articles from خطبات مشران (published by Jagamohan Narain Mushran Retired Judge, 726 Vingfield Road, Lucknow):—

- ۱ شعرا کا خیر مقدم
  - ۲ سر سید مہموریل فلاح
  - ۳ گوگھلے کا غم
  - ۴ جنگ عظیم پر پہلا - دوسرا - تیسرا لکچر
  - ۵ گاندھی جی کا جہنم دن
  - ۶ ہندو مسلم اتحاد
  - ۷ حاضرین مشاعرہ کا خیر مقدم
- Paper II.—Detailed and Critical Study of Special author or period—GHALIB or DR. IQBAL.

*Books to be consulted for Special study of Ghalib :—*

- ۱ یادگار غالب از مولانا حالی
- ۲ شرح دیوان غالب از مولانا علی حیدر، نظم طبعاً طباطبائی
- ۳ مکمل سنن دہلی غالب از ڈاکٹر عبدالرحمان بجنوری
- ۴ غالب از ڈاکٹر عبداللطیف پروفیسر جامع عثمانیہ حیدر آباد دکن
- ۵ مکتوب غالب مرتبہ امتیاز علی عرشی
- ۶ غالب نامہ از محمد انوار
- ۷ حالات غالب ز داستان تاریخ اردو، نوریہ حامد حسن قادری
- ۸ غالب از غلام رسول مہر
- ۹ خطوط غالب از مہیش پرشاد

*Books suggested for Special study of Iqbal :—*

- ۱ سورت اقبال از مولوی محمد طاہر فاروقی (شائع کردہ قومی کتب خانہ لاہور)
  - ۲ روح اقبال—از ڈاکٹر یوسف حسن خاں (ادارہ ادبیات اردو حیدر آباد دکن)
  - ۳ اقبال—(شائع کردہ انجمن ترقی اردو دہلی)
  - ۴ مقالات یوم اقبال—(شائع کردہ قومی کتب خانہ لاہور)
- (5) The Poet of the East, by A. Anwar Beg, (Qaumi Kutubkhana, Lahore).
- (6) Aspects of Iqbal, [Qaumi Kutubkhana, Lahore].

- (7) Iqbal's Educational Philosophy, K. G. Saidain.  
[Jamia Miliya, Delhi]  
(8) Modern Islam in India by Prof. Smith, Islamia  
College, Lahore (Chapters on Iqbal only).

Paper III.—Principles of Criticism and the General History  
of Urdu Literature. etc.

HALI :—Muqaddam-i-Shair-o-Shairi.

MOHI UDDIN QADRI : Rooh-e-Tanqid.

AZAD : A-be-Hav'at.

ABDUS SALAM NADVI : Sherul Hind Vols. I. & II.

HAMID HASAN QADRI : Dastan-i-Tarikh Urdu.  
(Laxmi Narain Agarwal, Agra).

MAJNOON GOKAKHPURI : Adab aur Zindagi.  
(Second edition)

Salnama Nigar for January and February, 1942.

HAMID HASAN QADRI : Naqd-o-Nazar

EHTSHAM HUSAIN : Tanqidi Jaizey Published by  
Idara Ishaat, Urdu. Hyderabad

Paper IV.—Comparative Philology of Modern Indian Languages

Encyclopædia Britannica, Fourteenth edition  
[Articles on Grammar, Philology & Hindustani].

M AHMAD UD-DIN : Sar Guzashte Alfaz

KHWAJA ABDUL RAUF ISHRAT : I-lah-e-zoban-e-  
Urdu.

HAMID-U'L-LAH KHAN YUSUFZAI : Lisan aur  
Mutala-i-Lisan.

MOHIUDDIN QADRI ZOR : Hindustani Lisniyat.

WAHEEDUDDIN SALEEM : Waze Istilahat.

Paper V.—Old Texts.

Poetry—

انتخاب کلام مرثیہ مولوی عبدالعقوبی اے۔ دہلوی  
دیوان میر درد (صرف غزلیات)

کلمات ولّی مرثیہ مولانا احسن مارہروی  
(ردیف الف - د - م - ن - ز - ی)

سعد الدین مرثیہ حسن  
سودا—

سنگ کو اگلے لئے کرتا ہے پانی آسمان  
چون غلچہ آسمان نے مجھے پور غرض حال

- ۲ مستغنی ذاتی نہ مہرِ مکی ہو تستکھ  
۳ کہ ہے گلابِ دوران سے منشیِ تقدیر  
۵ سوائے خاک نہ کھینچو نکا منیت دستار

Prose—

- ۱ باغ و بہارِ مہرِ امن دہلوی سے مقدمہ مولوی  
عبداللہ حق بی - اے  
۲ نسانہ عجائب

Paper VI.—Mediæval Texts.

Poetry

مثنوی گلزارِ نسیم  
Dewan of Momin Ghazals only

الف - م - ن - و - ہا - یا

- مدحِ تجلی و چراغِ کعبہ - مولوی محسن لاکھڑی  
روحِ نظار (انتخابِ کلام - میانِ نظار اکبر آبادی) (دوسرا ایڈیشن)  
مرتبہ مختصر اکبر آبادی  
لصائد لائق

- ۱ دل کہ اس دیر مہن ہے گرسلہ نازِ بخت  
۲ یوہی میں ہر ضرور ہے حامِ شرابِ ناب  
۳ زہِ نشاط اگر کھچئے اسے تھریز  
۴ لاتا نہونگ سے ہے رنگ نئے چرخِ مستحیل  
۵ پائے نہ ایسا ایک بھی دن خوشتر آسمان  
دہلہ - انیس

- ۱ جب دن مہن سر بلند علی کا علم ہوا  
۱ سب قطع کی: صحافت شبِ افتاب نے  
۲ جب زلف کو کھولے ہوئے لہائے شبِ آنی

Prose—

NAZEER AHMAD : Majma Lectures, Vol 1.

- ۱ ادبی خطوطِ غالب مرتبہ مرزا محمد عسکری لکھنوی  
۱ انشائے بیخبر مرتبہ انتظامِ اللہ مدنی

مطبوعہ مولفائی پریس آگرہ

- ۲ مضامین شہلی (ادبی و تعلیمی) مطبوعہ مطبع معارف  
عظم گڑھ

Paper VII —(a) A Subsidiary Modern Indian Language ;  
Or

(b) A Basic Language ;  
Or

(c) An additional author or period other than one offered for Paper II.

(a) Subsidiary Languages

Hindi—

TULSIDAS : Ramayan (Ajodhya Kand).  
HARISHCHANDRA : Satya Harishchandra.  
MAITHILI SARAN GUPTA : Panchavati.  
PREM CHAND : Prem Dwadeshi.

Marathi—

R. KIRLOSKEAR : Sakuntala  
N. N. APIE : Usha Kal.  
N. KELKAR : Abhinava Kavyamala, Part IV  
G. G. AGARKAR : Nibandhamala, Part I.

Bengali—

RABINDRA NATH TAGORE : Sonar Tari.  
BANKIM CHANDRA CHATTERJEE : Kapal Kundala  
HARA PRASAD SHASTRI : Bharat Mahila.  
D. L. ROY : Shahjahan.

(b) Basic Languages :—

Arabic—

نصفه من از ابتدا تا صفحه ۲  
کتاب الصرف و کتاب النحو - عبدالرحمان امرتسري

Persian—

مقتضب مکاتیب عالمگیری (دام نراین نعل - بیسمو الہ آباد)  
فارسی گرامر از سید استق علی  
نکار عجم حصہ سوم (شاه ایادہ کمینی پبلشرز لاہور)

Paper VIII.—Essay on an advanced literary subject.

MARATHI

(For the Previous Examination of 1948).

per i.—Poetry from 1857 to the present day :—

1. DAMODAR SAVALARAM YANDE : Aravachina Kavita.

KRISHNASHASTRI CHIPLUNKAR : Padyaratnawali, Keshavasutanchi Kavita, 4th edition.

2. GORE : Chandrika.

GADKARI : Vagvaijayanti.

6. TAMBYANCHI KAVITA.

7. M. T. PATWARDHANA : Sudharaka.

8. YASHAWANT : Yashodhara.

Paper II.—Prose up to 1856 and History of Literature :—

1. V. N. DESHPANDE : Smritisthala.

2. Marathi Inscriptions

3. V. K. RAJWADE : Marathyanchya Itihasachi Sadhane. Khanda 8.

4. BHIAUSHEBACHI—Bakhar.

5. BABA PADMANJI : Yamunaparyatana.

6. V. L. BHAVE : Maharasthra Saraswati, Vols. I and II.

7. PROF. POTDAR : Marathi Gadyacha Ingraji Avatara.

8. V. P. NENE : Arvachina Marathi Sahitya.

Paper III.—Individual author and prose from 1857 to the present day :

A. 1. N. C. KELKAR : Gadya Guchcha,

2. Totayache Banda.

3. Naval puracha Samathanika.

4. Itihasavihara.

B. 5. Nibandhamala Nos. 1, 3, 4, 9, 10, 12, 15, 26, 42, 44, 49, 51

6. Agarkaranche Nibandha, Bhaga I.

7. Sudamyache Pohe.

8. Rikampanachi Kamagiri.

9. N. S. PHADKE : Navya Gujagoshti, Part I.

10. V. S. KHANDEKAR : Vana-Bhojana

Paper IV.—Poetry from 1630 to 1857.

1. R. D. RANADE : Ramadas Vachanamrita.

2. MOROPANTA : Striparva.

3. Y. N. KELKAR : Aitihasika Powade.

4. R. D. RANADE : Tukarama Vachanamrita.

5. NAGESHA : Sitasvayamvara.

6. VAMAN PANDIT : Kavitasamgraha Bhaga I. [Nirnay Sagar edition].

7. RAGHUNATHA PANDIT : Nala-damayanti Swayamvara.

8. SAMRAJ : Rukmini Swayamvara.

(For the Final Examination of 1949).

Paper I.—Form of Literature : Literary Criticism.

1. CHIPLUNKAR : Vammayavishayaka Nibandha.

2. BANAHATTI : Mayurakavyavivechana.
3. KELKAR : Sahityakhanda.
4. N. S. PHADKE : Pratibhasadhana.
5. V. S. KHANDEKAR : Gadkari, Vyakti va Vanmaya
6. Dr K. N. WATWE : Rasavimarsha.
7. POTDAR : Vividha Darshana.
8. Y. G. JOSHI : Sahityikanchi Safara.

**Paper II.—Poetry up to 1630.**

1. BHASKAR : Shishupalawadha.
2. JHANESHWARI, Chapters VI, IX, XII, XIII.
3. NAMADEVA, Gatha, Abhangas 1 to 939. Chitrasahala Press edition (shake 1853) pp. 81-301.
4. EKANATH : Rukminiswayamvara.
5. MUKTESHWARA : Adi Parya.
6. DASOPANT : Gitaranva, II, XII.
7. V. N. DESHPANDE : Adya Marathi Kavayitri.

**Paper III.—Philology etc.**

1. P. D. GUNE : Introduction to Philology.
2. Controversy on the origin of Marathi Language, Vividha Jnana Vistara, Vol. 53.
3. Dr. V. G. PARAJAPYE : Marathi Bhashhecha Vikasa. (Bloch translated).
4. K. P. KULKARNI : Marathi Bhasba, Udgama Va Vikasa.
5. Milestones in Gujrati Literature.

Or

5. [a] NARASIMYACHARVA : History of Kannada Language.

[b] E. P. RICE : Kannada Literature.

Or

5. R. B. SAKSENA : History of Urdu Literature.

Or

5. RAMCHANDRA SHUKLA : Hindi Shitya ka Itihasa (Enlarged edition).

Or

5. S.V. PENDSE : Sankrita Vanmayacha Itihasa.

**Paper IV.—Essay. Translation and a Prakrit Text for Prakrit Grammar and Translation from the Prakrit into Marathi :—**

1. Hala's Gatha Saptashati [Nirnayasagar Edition].

## PHILOSOPHY

(For the Previous and Final Examinations of 1949.)

There will be *seven* papers. One of the papers shall be an Essay on a Philosophical subject. The Essay shall be taken at the Final Examination. Of the rest any *three* may be taken in the Previous and the remaining *three* will be taken in the Final. The Papers shall be as follows:—

## Paper I.—Ethics.

[a] *Modern Ethics*—

BRADLEY : Ethical Studies.

RASHDALL : Theory of Good and Evil.

Or

[b] *Ancient Ethics*—

PLATO : Republic—Jowett's translation [O. U. P.]

ARISTOTLE : Nicomachean Ethics—Ross's translation [O. U. P.]

BURNET : Greek Philosophy—Thales to Plato.

## Paper II.—Psychology.

WOODWORTH : R. S. Contemporary Schools of Psychology [Methuen].

MACDOUGAL : Outlines of Psychology and Abnormal Psychology [Methuen].

Note.—Candidates are expected to know something of the attitude of Indian philosophy to the psychological problems of perception.

## Paper III.—Modern western Metaphysics in its historical development.

TAYLOR : Elements of Metaphysics.

HUME : Treatise, Part I.

WATSON : Selections from Kant [Critique of Pure Reason only].

THILLY : A History of Philosophy [Modern Period only i. e. from p. 250].

## Paper IV.—Indian Philosophy.

HIRIYANNA : Outlines of Indian Philosophy.

DAS GUPTA : History of Indian Philosophy Vol. I

Note.—Students are expected to relate their study to modern tendencies of thought and for this purpose Joad's introduction is recommended. It is not intended to be an additional text-book.



Papers V and VI.—Any *two* of the following :—

- [a] Logic.  
JOSEPH : An Introduction to Logic (O. U. P.)  
STEBBING : A Modern Introduction to Logic  
(Methuen), Revised edition.
- [b] Special study of an Indian or Western Philosophy.  
SHAKARA : Vedanta Sūtras with Shankarabhashya  
Adhyaya I. Pada 1 and Sūtras 1-4. Adhyaya II.  
Padas 1 and 2.  
DENSSEGI : The system of the Vedanta.

Note.—Students are expected to study the texts, on which questions will be set.

Or

- BERGSON : Creative Evolution.
- [c] Philosophy of Religion.  
PRINGLE PAITISON : Idea of God.  
CAIRD : Introduction to the Philosophy of Religion.  
JAMES : Varieties of Religious Experience.

Paper VII.—Essay.

Under the Essay, sufficient choice will be given on problems connected with the various branches of the subject.

### ECONOMICS

[For the Previous and Final Examinations of 1949].

There shall be *eight* papers out of which a candidate shall be required to take *four* papers in the Previous and *four* papers in the Final Examination as specified below :—

- I. Of the following three papers, either [a] or [b] shall be taken in the Previous and the other and [c] in the Final Examination :—

- [a] Principles of Economics.  
[b] History of Economic Thought, including the History of Socialism.  
[c] Essay.

- II. Of the following papers any *three* may be taken in the Previous and any *two* out of the remaining in the Final Examination :—

- [a] Economic Development and Present Economic Conditions of India and England.  
[b] Financial Organisation.

- [c] The State and Economic Welfare.
- [d] Labour Problems and Social Welfare.
- [e] Rural and Municipal Economics.
- [f] Theory and Practice of Statistics.
- [g] Co-operation.
- [h] Transport
- [i] International Trade and Foreign Exchange.

Note.—Books marked with an asterisk to be read, others only to be consulted

Paper I [a]—*Principles of Economics*—Theory of consumption. Natural resources, human beings, and capital goods as economic factors. Theory of population. Organisation of industry. Industrial combination. Markets and trading. Theory of value. Joint-product prices. Monopoly price. Discriminating price. Money and prices. Theory of distribution. Speculation. Organised markets. Forms of business organisation. Control of monopolies. Principles of Economic Planning. Scope and Method of Economics.

Books recommended :—

- \*MARSHALL : Principles of Economics Books I, III and V.
- \*FISHER : The Nature of Capital and Income.
- \*PIGOU : The Economics of Welfare, Part I.
- CLARK : Essentials of Economic Theory.
- \*TAUSSIG : Principles of Economics.
- WICKSELL : Lectures on Political Economy, Vol. I.
- CARR-SAUNDERS : World Population.
- COLE : Principles of Economic Planning.
- ROBBINS : The Nature and significance of Economics, [Macmillan].

PIGOU : Economics in Practice.

Paper I (b).—*History of Economic Thought*, including the History of Socialism—Mercantilism. The Physiocrats Adam-Smith and the Manchester School, Malthus Ricardo Carey, Bastiat. Senior, Sismondi, List Utopian or Bourgeois Socialism : Saint-Simon, Fourier, Owen. Proletarian Socialism, Louis Blanc, Proudhon, John Stuart Mill, Marshall, Economic Thought in the 20th century. Scientific Socialism : Rodbertus Lassalle, Karl Marx. The German Historical School : Roscher, Hildebrand, Knies, Schmoller. The Austrian School : Menger Wieser, Bohm-Bawerk. Modern Socialism

Books recommended :—

- \*HANEY : History of Economic Thought.

\*GIDE AND RIST : History of Economic Doctrines

OTHMAR SPANN : Types of Economic Theory.

CANNAN : Review of Economic Theory.

BRIJ NARAIN : Tendencies in recent Economic Thought,  
(Delhi University)

SCOTT : History of Economic Thought

URANGYI SANGER : Economics in the 20th Century

TUGWELL : Trend of Economics

MARKHAM : History of Socialism.

Paper I (c).—*Essay*. A large number of general subjects shall be the topics for essay, out of which a candidate will have to choose one. These subjects should be so chosen as to have at least one from the subjects prescribed under Groups I and II in the course.

Paper II (a) — *Economic Development and present economic conditions of India and England* with special reference to the period after 1760. The Manor. The Guilds. The Domestic System. The Agricultural Revolution. The Industrial Revolution. A broad outline of the development in India of the Industries of Jute, Cotton, Sugar, Iron, Steel and Coal. The Factory System, Changes in Transportation and Marketing and their effects. Similar material for India as far as possible. Brief history of the inventions between 1760 and 1790 and their economic effects. The State and labour. The modern economic structure. Trade unionism. Wage contracts; Public finance. Tariff. The history of inventions and of the status of labour to be treated briefly from relevant chapters in Economic History of England by Meredith.

Books recommended—

\*MEREDITH : Economic History of England.

VERMA ANSTEY : Economic Development of India.

\*GADGIL : The Industrial Evolution of India.

KNOWLES : The Industrial and Commercial Revolution in Great Britain during the 19th Century.

ASHLEY : Economic Organisation of England.

D. H. BUCHANAN . Development of Capitalist Enterprise in India.

Paper II (b).—*Financial Organization*—

social importance of money. Principles of currency circulation. Services and nature of money movements and flow of money. Value of money. Stability of the money. Credit and prices. Measurement of varia-

tions in the value of money. Deferred payments. Bi-metal-  
lism. Convertible and inconvertible paper money.

The Processes of inflation and deflation. Their effects on  
the value of gold, prices, foreign exchanges, purchasing  
power parity, international trade and State finance. Stabilisa-  
tion of monetary standards. Effects of international debts.

Brief history of Indian currency up to 1893. Measures  
taken in 1893 and 1899. The gold exchange standard. The  
gold standard reserve. Amalgamation of the gold standard  
and paper currency reserves. Council and Reverse Council  
Bills. The proposed gold bullion standard.

Banking : organization, operation. The cheque system.  
Bank notes. Convertibility. Reserve system : fixed, fiduciary  
and proportional. The Indian banking system : the Imperial  
Bank of India, Joint-stock banks, exchange banks, Govern-  
ment Treasury system, indigenous banking, co-operative  
banks, saving banks. The Reserve Bank

Books recommended—

SPALDING : Eastern Exchange, Currency and Finance.

COLE : Money.

E. M. BARNSTEIN : Money and the Economic System.  
(Chapel Hill, The University of North Carolina  
Press).

Report of the Central Banking Enquiry Committee.

PAUL EINZIG : Monetary Reform.

BASU : Recent Developments in Monetary Theory and  
Practice.

CROWTHER : Money.

MALHOTRA : History of Indian Currency.

Paper II (c).—*The State and Economic Welfare*—

This course is a study of the relative efficiency or public  
and private activities as a means to certain economic ends).  
Taxes and other kinds of revenue. Their effects upon pro-  
duction and distribution and their other effects. Public  
Expenditure : Its effects upon production and distribution,  
the economic basis of expenditure for the security of life and  
property, for sanitation and education. Loans and Budgets.  
Social Insurance, including workmen's compensation and  
insurance against unemployment. Government regulation of  
Production. Adulteration. Control of food and drugs.  
Factory Legislation. Prices and Monopolies. State aid to

industries. Public Research and Information Bureau. Government Control of Public Works and Public Utilities. Indian Finance : Decentralization Provincial contracts. Changes since 1920. Merit award. Financial position of the Provinces. Financial changes under the Government of India Act, 1935.

**Books recommended—**

\*SHIRRAS : The Science of Public Finance

Report of the Taxation Enquiry Committee.

DALTON : Public Finance.

PIGOU : Economics of Welfare (Chapters dealing with Government control).

Indian Workmen's Compensation Acts.

Indian Factory Acts.

SILVERMAN : Economics of Social Problems.

Clow : State and Industry.

THOMAS : Federal Finance in India.

B. R. MISRA : Provincial Finance from 1919-39.

ADARKAR : Report on sickness Insurance in India.

**Consult :—**

ADARKAR . Federal Finance in India.

J. P. C. Report.

Paper II (d)—*Labour Problems and Social Welfare—*  
Life of the Labouring Classes in Typical Indian Industries,  
Wage and hours. Trade Unionism : Their Principles,  
achievements, and possibilities in England and India Labour  
disputes. Arbitration and Conciliation. Works Committees  
and Trade Councils Profit-sharing, Co-partnership and Pro-  
ducers' Co-operation. Social Welfare Work and Social Service  
Agencies in India. Housing projects in India and England.  
Debt and Co-operative Credit for Employees, Unemployment.  
Labour Agencies and Labour Exchanges. (Social Insurance  
Workmen's Compensation. and Factory Legislation, which  
are included in the course, are to be reviewed briefly)  
Methods of paying wages.

**Books recommended—**

COLE : History of Working Class Movement in England,  
Parts I—III.

\*PIGOU : Economics of Welfare, Part III.

A. WILLIAMS : Co-partnership and Profit-sharing.

Reports on Social Welfare. Work of the Calcutta and  
Bombay Leagues. The Tata Iron and Steel Com-  
pany and the British India Corporation, Calcutta.

NETTLEFOLD : Practical Housing.

\*Report of the Indian Labour Commission.

Industrial Labour in India (I. L. O.)

RICHARDSON : Industrial Relations in England (I. L. O.)

BEVERIDGE : Social Insurance in England.

BEVERIDGE : Social Security Plan.

ADARKARS : Report on sickness Insurance in India.

Paper II (e) — *Rural and Municipal Economics.*—

Land Tenures. Agriculture Improvements, Irrigation and Communications. The importance and possibilities of village industries. District Board finance. Contrast between Rural and Municipal Problems. Congestion Town Planning. Building. Regulations Sanitation. Municipal Finance Consolidation and sub-division of holdings. Live-stock and Agriculture. Water power Marketing of Agricultural products Financing of Agriculture. Short and long term loans, Land mortgage banks. Forests. Soil erosion. Famines : history ; preventive and remedial measures. Village industries : present condition, causes of decay, lines of improvement State in relation to Agriculture. Demonstration farms.

Books recommended—

DARLING : The Punjab Peasant in Prosperity and Debt

NOURSE : Agricultural Economics.

BADEN POWELL : Land Revenue. System of British India.

U. P. District Board Act

U. P. Tenancy Act, 1939.

FIVER : Municipal Trading (Allen and Unwin).

GANGULEE : Trends of Agriculture and Population in the Ganges Valley (Rama Krishna & Sons, Lahore)

Report of the Royal Commission on Indian Agriculture.

BALJIT SINGH : Land of the Two Rivers.

MISRA : Land Revenue Policy in U. P.

NANAVATEE and ABJANEE : Indian Rural Problem.

DR. M. P. SHARMA : Local Self Government in U. P.

BUCK and OTHERS : Municipal Finance.

Paper II (f) — *Theory and Practice of Statistics.*

Scope and utility of Statistics Enumeration, compilation and tabulation of data Averages Dispersion. Skewness Graphic Method. Accuracy. Index numbers. Interpolation. Association. Contingency. Correlation. Sampling. Common errors in Statistics.

## Books recommended—

BOWLEY : Elements of Statistics.

BOWLEY : Elementary Manual of Statistics (Second edition).

YULE : An introduction to the Theory of Statistics.

HARVARD : Economic Series—Review of Economic Statistics.

SECRIST : Introduction to Statistical Methods

Statistical Abstracts for British India

BODDINGTON : Statistics for Commercial Students.

BOWLEY AND ROBERTSON : Report on the Census of Production in India.

MILL : Statistics.

GHOSH AND CHAUDHARI Statistics—Theory and Practice

P. J. THOMAS and SASTRI : Agricultural Statistics in India

## Paper II (g)—Co-operation.

*Historical*—Robert Owen. Communist Colonies. The Rochdale Pioneers. The English Co-operative Wholesale Society; Raiffeisen and Schulze-Delitzsch systems. Outline of Irish, Swedish and Danish systems.

*THEORY*—Co-operative Production Industrial Co-operation. Co-operation in Agriculture. Co-operative Marketing. Co-operative Distribution. Co-operative Credit.

*INDIAN*.—Co-operative Organization. Primary Rural Societies. Provincial and Central or District Banks.

## Books recommended—

\*C. R. FAY : Co-operation at Home and Abroad, Vols. I and II

KAJI : Co-operation in India.

H. CALVERT : The Law and Principles of Co-operation in India.

\*Report of the Mc Lagan Committee on Indian Co-operation.

JOHN MATTHAI : Agriculture Co-operation in India.

TALMAKI : Co-operation in India and Abroad

Indian Co-operative Review [Madras].

V. RAM DAS PANTALU : Indian Co-operative Directory.

## Paper II (h).—Transport.

*RAILWAY*.—Capital and working expenses. Application of laws of productivity. Combination, Competition and

monopoly in transport. Determination of rates and fares. Classification of goods. State regulation of rates and fares. State ownership and management.

**INDIAN RAILWAYS.**—Present situation, Finance Controlling authority. Determination of rates and fares. Systems of management.

**ROAD**—Transport of goods and merchandies. Types of vehicles. Rural transport. City transport. The motor bus. The tramway. Competition and monopoly in road transport. Determination of rates and fares. Classification, administration and maintenance. Taxation of road vehicles. Water transport—inland and oceanic.

**WATERWAY.**—Inland and coastal (Indian).

Books recommended—

\*DOUGLOUS KNOOP : Outlines of Railway Economics.

\*ACKWORTH : Elements of Railway Economics.

\*MARSHALL : Industry and Trade, Book III, Chapters 3-6.

\*FENELON : Economics of Road Transport.

FENELON : Transport Co-ordination.

SRINIVASAN : Theory of Rates and Fares in India.

KIRKNESS and MITHEL : Report of the Road and Railway Competition Committee

Co-ordination and Development of transport (Final Report), H. M. S. Office, London, 1931.

Proceedings of the Railroad Conference, 1933.

The Indian Motor vehicles Act, 1939.

Wedgwood Committee Report on Indian Railways.

S. N. HAJI : Economics of Shipping.

FENELON : Economics of Rail Transport.

Paper 11 (*i* **International Trade and Foreign Exchange.**—

International trade theory, comparative costs. Interpretation in terms of goods and prices. Advantages and disadvantages of international trade. Effects of the operation of the laws of increasing and diminishing returns upon international trade. International value. Money in international trade. Effects of price variation on the course of international trade.

**Foreign Exchange.**—Par of Exchange : Mint par of exchange in cases of currencies of different metals and inconvertible paper money. Fluctuations of exchanges ; causes and correctives.



*Tariff Policy.*—Free trade, protection. Imperial preference dumping

Books recommended—

\* BASTABLE : Theory of International Trade

TAUSSIG : International Trade

CLARE and CRUMP : A. B. C. of Foreign Exchange.

Report of the Indian Fiscal Commission.

BARRATT WHALE : International Trade.

PAUL EINZIG : Exchange Control

PAUL EINZIG : Exchange Clearing.

BERTIL OHLIN : Interregional and International Trade.

THOMAS : Principles and Arithmetic of Foreign Exchange.

KINDLEBERGE : International Short term Capital Movements [Columbia Un Press].

## HISTORY

(For the Previous and Final Examinations of 1949)

Paper I—Modern Political Theory (from Herbert Spencer to the present day) and Institutions, including the Modern Constitutions of England, Canada, U. S. A., Switzerland and France.

1. LASKI Grammar of Politics, Part I

BARKER : Political Thought in England—From Spencer to the Present Day.

FINER : Theory and Practice of Modern Government [abridged edition in one volume].

F. W. COKER : Recent Political Thought

E. BARKER : The Citizen's Choice.

Paper II.—A selected period of English History—1815—1914.

MARRIOTT : England Since Waterloo.

MARRIOTT : History of our own times.

Cambridge History of British Foreign Policy [relevant portions].

WOODWARD : The Age of Reform [O. U. P.]

STRACHEY : Victoria.

TREVELYAN : British History in the Nineteenth Century.

The Cambridge Modern History [relevant portions].

GILBERT SLATER : Making of Modern England [New edn]

R. C. K. ENSOR : England, 1870—1914 [O. U. P.]

RAMSAY MUIR : A Short History of the British Commonwealth, Vol. II.

Paper III.—A selected period of European History.

[a] Revolutionary and Napoleonic Era, 1780—1815.

MADELIN : French Revolution.

MADELIN : The Revolutionaries.

FOURNIER : Napoleon

ACTON : Lectures on the French Revolution.

YOUNG : Travels in France.

FISHER : Bonapartism.

Cambridge Modern History, Vols. VIII and IX.

MADELIN : The Consulate and the Empire, Vols. I and II.

ELTON : Revolutionary Idea in France.

Or

[b] Contemporary Europe, 1871—1914.

TURNER : Europe Since 1870.

ROSE : Development of European Nations.

Cambridge Modern History, Vol. XII.

GOOCH : History of Europe

GOOCH : Before the War Vol. I.

Papers IV and V.—One of the following periods of Indian History, each period comprising two papers :—

A.—ANCIENT INDIA

[a] The Maurya Empire.

KAUTILYA : Arthashastra.

MEGASTHENES : Indica

Cambridge History of India, Vol. I.

BHANDARKAR : Asoka.

MUKERJI : Asoka

HULTZSCH : Inscriptions of Asoka (Revised Edition).

H. C. ROY CHOWDHURY : Political History of Ancient India, 1938 edition (relevant portions)

BHARGAVA : Chandra Gupta Maurya.

R. K. MUKERJI : Chandra Gupta and his times.

[b] The Gupta Empire.

FLEET : Gupta Inscriptions.

ALLAN : Gupta Coins.

FA HIEN : Travels [tr. by Giles].

H. C. ROY CHOWDHURY : Political History of Ancient India, 1938 edition [relevant portions].

R. G. BASK : History of North East India.

R. D. BANERJEE : Age of the Imperial Guptas.

BASUDEO UPADHAYA : Gupta Samrajya ka-Itihas (India Press, Allahabad).

B.—MEDIAEVAL INDIA.

[a] Pre-Mughal India, 1200—1526, [Political History of Provincial Kingdoms excluded].

ELLIOT AND DOWSON : History of India. Vols. II, III and IV.

BRIGGS : Rise of Mohammedan Power.

R. P. TRIPATHI : Some Aspects of Muslim Administration.

ISHWARI PRASAD : History of the Qaraunah Turks in India.

TODD : Annals and Antiquities of Rajasthan [ed. by Crooke].

Tabkat-i Nasiri [translated by Raverty].

KING : History of the Deccan

Ibn Batutoa [translated by Lee]

Cambridge History of India, vol. III.

DORN : History of the Afghans.

MEHDI HUSAIN : The Rise and Fall of Muhammad Bin Tughlaq.

DR. HABIBULLAH : Foundations of Muslim Rule in India.

[b] Mughal India, Babar to Jahangir

Memoirs of Babar

Humayun Nama.

ABUL FAZAL : Akbar Nama.

ABUL FAZAL : Ain-i-Akbari.

Memoirs of Jahangir.

ELLIOT AND DOWSON : History of India, Vols. IV—VI.

R. P. TRIPATHI : Some Aspects of Muslim Administration.

Cambridge History of India, Vol. IV.

M. ROY CHOWDHURY : Din Ilahi.

Or

C—MODERN INDIA.

[a] Indian History from Clive to Wellesley.

Cambridge History of India, Vol. V.

FORREST : Clive.

JONES : Warren Hastings.

FORREST : Selections from papers of the Governors.

General—Warren Hastings and Cornwallis.

OWEN : Selections from Wellesley's Despatches.

ROBERTS : Life of Lord Wellesley

The Fifth Report (Firminger's Edition).

Poona Residency Correspondence : Volume VIII,

Daulat Rao Scindhia and North Indian Affairs (1794—1789), edited by Sir Jadu Nath Sarkar.

Volume IX, Daulat Rao Sindhia and North Indian Affairs (1800—1803) edited by Dr. Ragubir Singh.

NANDALAL CHATTERJEE : Mir Qasim

C. DAVIS : Administration of Warren Hastings.

CHATTERJI : Verelst's Rule in India [Indian Press, Allahabad].

ASHIRBADI LAL : Shuja-ud Daulah.

(b) India under the Crown, with special reference to Constitutional Development.

R. C. DUTT : India in the Victorian Age.

RONALDSHAY : Life of Lord Curzon, Vol. II.

LORD MORLEY : Recollections, Vol. II.

BANERJEE : A Nation in the Making.

KEITH : Constitutional History of India.

Cambridge History of India, Vol. VI

Paper VI.—A special study paper, one of the following :—

(a) The History of the Marathas 1627—1761.

SEN : Administrative System of the Marathas.

RANADE : Rise of the Maratha Power.

GRANT DUFF : History of the Marathas [O. U. P.]

ELLIOT AND DOWSON : History of India, Vols. VII and VIII.

SARDESAI : Main Currents of Maratha History (Revised edition).

SINHA : Rise of the Peshwas

SEN : Military System of the Marathas.

SARKAK : Shivaji and His Times (Revised Edition).

SIR J N. SARKAK : The House of Shivaji.

Or

(b) Economic History of India under British Rule.

R. C. DUTT : Economic History of British India (1757—1837).

R. C. DUTT : Economic History of India in the Victorian Age.

GADGIL : Industrial Evolution of India in recent times.

ANSTEY : Modern Economic Development of India.

SINHA : Economic Annals of Bengal.

JETHAR AND BERRY : Indian Economics.

WADIA AND MERCHANT : Our Economic Problems.  
(The New York Coy. Bombay).

Paper VII.—Essay.

### POLITICAL SCIENCE

(For the Previous and Final Examinations of 1949).

There shall be seven papers including one on Essay. The Essay must be taken in the Final Examination. Of the rest, any three may be taken in the Previous and the remaining three in the Final.

Paper I.—Ancient and Mediæval Political Thought.

The Sophists—Socrates. Political Thought of Plato and Aristotle, Epicureans and Stoics. Roman Political Thought.

The problem of Church and the State in the Middle Ages.

The Mediæval Theory of Corporations. Feudal Theory.

Theories of the Councillar Movement.

DUNNING : A History of Political Theories Vol. I.

BARKER : Plato and His Predecessors.

SABINE : A History of Political Theories.

GROSSMAN : Plato to-day.

NETTLESHIP : Lectures on Plato's Republic.

GIERKE : Political Theories of the Middle Ages with Maitland's Introduction.

HERANSHAW : Some Mediæval Thinkers.

For Reference—

PLATO : The Republic.

ARISTOTLE : Politic (Welden's Introduction).

CARLYLE : Mediæval Political Theory in the West.

FIGGIS : From Gerson to Grotius.

Paper II.—Modern Political Thought.

Reformation and Renaissance—Theories—Machiavelli.

According to Grotius. Theories of Contract and Natural Right.

Hobbes. Locke and Rousseau. The Historians—Vico,

Montesquieu and Burke The Utilitarians--Hume Bentham and Mills. The Evolutionists--Spencer and Huxley. The Idealists--Kant, Hegel, Green. Brodley and Bosanquet. The Socialistic Thought Pluralism and Fascism.

DUNNING : A Historical of Political Theories, Vols. II and III.

SABINE : A History of Political Theories

MERRIAM AND BARNES : A History of Political Theories, Recent Times

COKER : Recent Political Thought.

VAUGHAN : Studies in the History of Political Philosophy, Vols. I and II.

HOBHOUSE : Metaphysical Theory of the State.

*For Reference.*

HOBBS : Leviathan.

LOCKE : Civil Government.

ROUSSEAU : Social Contract.

MILL : Essays on Liberty, Representative Government etc.

GREEN : Lectures on Principles of Political Obligation.

BOSANQUET : Philosophical Theory of State.

LASKI : Grammar of Politics.

FOLLET : The New State.

RUSSEL : Roads to Freedom.

**Paper III.—Public Administration.**

The scope and nature of Public Administration. Relations between administration, legislature and judiciary. Legislative and Judicial powers of the administration in England and India. Organization of departments, Chief Departments in England and India Internal organisation of a Department. Organization of Personnel. The Civil Service in England and India—Recruitment—Training—Promotion—Discipline, etc. Public Service Commissions in England, India and Dominions. Financial organization in England and India—Budget procedure and method. Audit systems in England and India. Local Self-Government—England, India, America, etc.

WILLOUGHBY : Principles of Public Administration.

D. BURNS : White Hall.

H. FINER : British Civil Service.

T. L. HEATH : The Treasury.

GYAN CHAND : The Financial System of India Manual  
of Procedure of the Legislative Assembly.

Government of India Act and Rules made thereunder.

HERMAN FINER : English Local Government.

K. F. SHAH : India Municipalities.

WATTAL : A. B. C. of Federal Finance.

Paper IV.—(a) Modern Constitutions of India, Great Britain.

France, Australia, U. S. A., Italy, Russia and Japan.

VARMA AND SHARMA : Government of India.

OGG : English Government and Politics.

MUNRO : Governments of Europe.

LASKI : Parliamentary Government in England.

PUELL : New Governments of Europe.

MAXWELL : The Soviet State.

QUIGLEY : Japanese Government and Politics.

H. LASKI : American Presidency.

FINER HERMAN : Theory and Practice of Modern  
Governments 2 Vols.

Or

(b) Political Institutions—Ancient, Mediæval and  
Modern.

The rise and development of ancient city state. The  
Roman Empire and Provincial Administration. The Papacy.  
The Holy Roman Empire, Feudalism. Mediæval Guilds.  
The rise of Modern Nation State. Parliamentary and  
Presidential Governments Unitary and Federal Govern-  
ments. The Legislature. The Executive and the Judiciary.  
Direct Legislation. Party System. Methods of Representa-  
tion. Administrative Law. Judicial Review of Legislation.  
The Corporative State The Soviet State.

WARD FOWLER : City-States of Greeks and Romans.

SIDGWICK : Development of European Polity.

JENKS : The State and Nation.

FINER : Theory and Practice of Modern Governments.  
2 Vols.

MAXWELL : The Soviet State.

Papers V and VI—any two of the following :—

(i) Ancient Indian Political Thought and Institutions.

KAUTILYA : Arthashastra (Translated by  
stri).

Mahabharata, Santiparvam (Rajadharma).

Manusmriti, Chapter VII.

BENI PRASAD : Theory of Government in Ancient India.

BENI PRASAD : The State in Ancient India.

K. P. JAYASWAI : Hindu Polity.

WISHWANATH : International Law in Ancient India.

RAMCHANDRA DIKSHITA : Hindu Administrative Institute.

Cambridge History of India, Vol. I, Chapters IV, V, X, XI and XII.

(2) Development of Modern Indian Constitution (1858 to the Present day).

Government of India Act, 1858. Indian Councils Acts 1861, 1892 and 1909. Montagu-Cheemsford Reforms, 1919. Government of India Act, 1935. Development of the Indian Legislature. Governor-General's Council. Relation between Government of India and Home Government. Central—Provincial Relations—Legislative, Financial and administrative. Evolution of Self Local Government. Development of Nationalism. Indian States and their relations with the Paramount Power.

SAPRE : The Growth of the Indian Constitution and Administration.

P. MUKERJI : Indian Constitutional Documents.

G. N. SINGH : Indian States and the Government of India.

G. N. SINGH : Landmarks in Indian Constitutional and National Development.

KEITH ; Constitutional History of India, 1600—1935. Government of India Act, 1935.

Rules made under the Government of India Act.

(3) Islamic Political Thought and Institutions.

ARNOLD : The Caliphate.

VON KREMER : Contributions to the History of Islamic Civilization.

IBN KHALDUN : Muqaddameh.

ABUL RAHIM : Muslim Jurisprudence.

AGHINIDES : Theories of Musalman Finance.

Cambridge Mediæval History : Vol. II, Chapter X; Vol. III, Chapter XVI ; Vol. IV, Chapter X.



## (4) Ancient and Medieval Political Institutions.

SIDGWICK : Development of European Polity.

GREENIDGE : Greek Constitutional History.

GREENIDGE : Roman Public Life.

ARNOLD : Roman Provincial Administration.

Cambridge Ancient History (relevant chapters).

JENKS : Law and Politics during the Middle Ages.

## (5) International Relations.

Rise of modern Imperialism, Partition of Africa, China and the rest of Asia. American Policy in Central and South America. The Monroe Doctrine. The Triple Alliance and the Triple Entente. The Eastern Question. The Great War. and the Peace Treaties. The League of Nations. The Movements for the establishment of a system of international Security. The Locarno Treaties. The Kellogg Pact. The Rise of Nazism in Germany. Franco Soviet Alliance. The Far East Politics. Italo-Abyssinian War. The Munich Pact and the Second Great War.

HARDY : *A Short History of International Affairs.*

CARR : International Relations since the Peace Treaties.

EMERY AND SIMONS : The Great Powers in World Politics.

P. TREAT : The Far East.

PEARS HIGGINS : Studies in International Law and Relations.

BUELL : International Relations.

TOYNBEE : Survey of International Affairs.

HOWARD ELLIS : The origin structure and the working of the League of Nations.

STREIT : Union Now.

GIBBON : Introduction to World Politics.

MOON : Imperialism and World Politics.

SCHUMANN : International Politics

SHARP AND KIRK : Contemporary International Politics.

## (6) Principles of Sociology.

GIDDINGS : Principles of Sociology.

TYLER . Primitive Culture.

HOBHOUSE : Social Development.

GINSBERG : Social Psychology.

MC DOUGALL : The Group Mind.

GRAHAM WALLAS : The Great Society.

**(7) Political Thought in the XX Century.**

Problems of Democracy and Schools of Socialism. Instinct in Politics. The Psychologists. Pluralism. Group Organization. Public Opinion. Theories of Representation. Fascism.

WALLAS : Human Nature in Politics.

BARKER : Political Thought from Spencer to To-day  
(H. U. L.)

LASKI : The State in Theory and Practice.

LIPPMAN : Public Opinion

COLE : Social Theory.

FOLLET : The New State.

DUGUIT : Law and Modern State.

KRABBE : Modern Idea of State.

STRACHEY : Theory and Practice of Socialism.

ELLIOT : Pragmatic Revolt in Politics.

COKER : Recent Political Thought.

MERRIAM AND BARNES : Political Theories: Recent Times.

Paper VIII—Essay.

## GEOGRAPHY

*(For the Previous Examination 1948).*

### Paper I—Principles of Physical Geography.

- (1) The Earth as a planet ; its movement and relation to the sun ; Distribution of insolation.
- (2) THE ATMOSPHERE : Pressure ; temperature ; precipitation ; world factors of climate and climatic types.
- (3) Oceans.
- (4) LANDS : Materials of the earth's crust ; crustal movements ; forces of erosion ; land forms : structure of the earth ; evolution of landforms ; vegetation types.

### Books recommended—

TARR AND MARTIN : College Physiography.

SALISBURY : Physiography.

HOBBS : Earth Features and their meanings.

TARR : Study of the Scientific Scenery.

JOLLY : Surface History of the Earth.

SUESS : Face of the Earth.

COLEMAN : Ice Ages.

RAMMAN : Soils and their Classification.

BROOKS : The Weather.

KENDREWS : Climate.

KENDREWS : Climates of the Continents.

AUSTIN MILLER : Climatology.

DE LAPPARANT : Physical Geography.

Paper II.—Principles of Human Geography.

(1) Content and aims of Human Geography :—The Scope and interrelation of racial, social, economic and political aspects of Human Geography. Its place among Social Sciences.

(2) Types of Physical Environment considered from the standpoint of Human life Primitive use of Physical Environment.

(3) Outlines of Racial Geography ; Meaning of the term race, Criteria of racial types ; physical characters and racial types, considered as an adjustment of physical environment, Association of mental and other traits with different physical types ; the extent to which racial classification is possible and useful ; movement and distribution of chief racial types.

(4) Some aspects of the Human Geography of India. Outlines of the racial and social geography of India ; its relationship with the political geography and larger features of the economic life of the country ; a survey of Indian problems.

Books recommended :—

VIDAL BLACHE : Principles of Human Geography.

BRUNHES : Human Geography.

ROKBY : Scope and Aims of Human Geography.

FLEURE : Human Geography in Western Europe.

SEMPLER : Influences of Geography Environment.

DE PREVILLE : Les Sociétés Africaines.

DEMOLINS : Comment La Route Cree le Type Social.

GANTIER : Nomad and Sedentary Types of N. Africa.

ARBOS : Geography of Pastoral Life.

TON : Forests and Human Progress.

FEBRE : Geographical Introduction to History.

WISSNER : Man and Culture

FLEURE : Races of Mankind.

HADDON : Races of Man.

KROBER : Anthropology.

FAIRGRIEVE : Geography and World Power.

Paper III.—Regional Geography of Asia.

Structure ; relief ; important types of rocks ; their distribution and influence on topography ; distribution of chief types of land-forms ; their influence on the distribution of population. Climatic factors and climatic types ; Natural and Human Geography ; Distribution of Natural Vegetations ; Forest and their economic products ; minerals, sources of power and its relationship with industrial development. Trade and Routes : Chief racial characteristics and degree of adaptability to environment ; Geographical background of modern political background—

Books recommended—

STAMP : ASIA.

BERGSMARCH : Economic Geography of Asia.

MOULTON : Japan.

UYEHARA : Industry and Trade of Japan

CRESSEY : Geographic Foundation of Chiha.

BUXTON : China.

GREGORY : Structure of Asia.

LITTLE : Far East.

Or

Regional Geography of Europe with British Isles in greater detail.

Structure, relief, important types of rocks : their distribution and influence on topography. Distribution of chief types of land-forms, their influence on the distribution of population ; Climatic factors and climatic types within the country ; Natural and Human Geography ; Distribution of natural vegetation ; Forests and their Economic products ; Sources of Power and their relationship with industrial development ; Trade and Routes ; Chief racial characteristics, and degree of adaptability to environment ; Geographical background of modern political environment.

Books recommended—

BLANCHARD and VISHAR : Economic Geography of Europe

BLANCHARD and CRIST : Geography of Europe.

SHACKELTON : Europe.

LABORDE : Western Europe.  
 NEWBIGIN : Mediterranean Lands.  
 CUNDAL : Western Europe.  
 PARTSCH : Central Europe.  
 MILKHAYLOW : Soviet Geography.  
 SEMPLE : Geography of Mediterranean Lands.  
 NEWBIGIN : Some Geographical Aspects of the Balkan Peninsula.

Books recommended for British Isles.

MACKINDER : Britain and British Seas.  
 JONES : North East England.  
 BYGOTT : Eastern England.  
 OGILVIE : Regional Essays on Great Britain.  
 STAMP AND BEAVER : British Isles.

Paper IV—*Any one of the following :—*

- (1) The three Southern Continents.
- (2) Economic Geography.
- (3) Geomorphology.
- (4) Climatology.
- (5) History of Geographical Knowledge and Discovery  
*(For the Final Examination of 1949).*

Paper I.—Regional Geography of India.

Books recommended—

VERA ANSTEY : Economic Development of India.  
 BLANDFORD : Climate and Weather of India, Burma and Ceylon.  
 RISLEY : Peoples of India.  
 D. N. WADIA : Geology of India.  
 WADIA AND JOSHI : Wealth of India.  
 BROWN : Mineral Wealth of India.  
 Census Report of India.  
 HOLDICH : India.  
 Report of the Royal Commission on Agriculture and Irrigation.  
 VERA ANSTLEY : Trade of the Indian Ocean.  
 Imperial Gazeteer, Parts I, II and III.  
 Indian Year Book.  
 Industries Year Book.

Papers II and III.—Any *two* of the following excluding the ones offered for the Previous Examination.—

(1) Regional Geography of the three southern Continents.

Structure, relief, important types of rocks, and their distribution and influence on topography ; Distribution of the chief types of Land-forms, their influence on the distribution of population ; Climatic factors and climatic types within the continents ; Natural and Human regions ; Natural Vegetation. Forests and their Economic Products ; Minerals, sources of power and relationship with industrial development ; Trade and Routes ; Chief racial characteristics and degree of adaptability to environment. Geographical background of Modern political problems.

Books recommended—

LABORDE : Australia, New Zealand. and Pacific Islands.  
TAYLOR : Australia.  
SUGGATE : Australia and New Zealand.  
Year Book of Australia and New Zealand.  
FITZGERALD : Africa.  
SUGGATE : Africa.  
STRENTZ and MARBAT : Vegetation and Soils of Africa.  
KNOX : Climate of the Continent of Africa.  
SULLIVAN : Economic Geography of South Africa.  
Official Year Book of the Union of South Africa.  
Year Book of East Africa.  
SHANAHAN : South America.  
WHITBECK : Economic Geography of South America.  
JONES : Commerce of South America.  
JEFFERSON : Peopling of Argentine Pampas.

(2) Economic Geography.

Study of Geographical factors affecting production of raw materials and foodstuffs. Distribution of manufactures. Development of power resources. Agricultural Products Consumption and Exports. Forests and their Products. Trade and transport.

Books recommended—

RUDMOSE BROWN : Principles of Economic Geography.  
HUNTINGDON WILLIAMS and VALKENBARG : Economic and Social Geography.

HUNTINGDON, WILLIAMS and VALKENBARG : Industrial Geography.

FAWCETT : Economic Geography of the British Empire.

SARGENT : Seaways of the Empire.

RUSSEL SMITH : Industrial and Commercial Geography.

CHISHOLM : Commercial Geography.

COLBY : Source Book of the Economic Geography of N. America.

### (3) Geomorphology.

Theories accounting for the present distribution of land and water ; Interior of the Earth ; Isostasy ; Origin and Development of major types of relief features ; Evolution of different types of land forms and study of their characteristics.

The Earth as a Planet : Birth of the Earth.

Theories of Cosmogony.

Surface History of the Earth—Isostasy.

The Earth's Interior—Seismology.

Theories of Interior Building

The Alpine Masses.

General Principles of Paleogeography.

Tectonics and History of Continents, and of the Asiatic and Pacific Oceans.

#### Books recommended—

SUESS : Face of the Earth.

WEGNER : Origin of Continents and Oceans.

JOLLY : Surface History of the Earth

DALY : Our Mobile Earth.

JEFFREYS : The Earth.

CHAMBERLAIN : The Origin of the Earth

DAVIDSON : The Two Solar.....

DAVIDSON : Manual of Seismology.

WITHERS : Building of north America.

COLLECT : Structure of the Alps.

HANG : Traite de Geologie.

ARGAND : La Technique de L'Asia.

### (5) Climatology.

Distribution of the elements of climate and the variation of seasonal and Annual. Weather types—their causes

and effects ; Weather conditions of the Upper Air ; Conditions of local circulation ; Precipitation and its causes and its different forms ; Study of climatic types of India in detail : Weather Forecasts.

**Books recommended—**

SHAW : Drama of Weather

SHAW : Forecasting Weather.

ABERCROMBIE : Weather.

MILLER : Climatology.

KENDREWS : Climate.

KENDREWS : Climate of the Continents.

BROOKS : Evolution of Climate.

BROOKS : Climate through the Ages

**(6) History of Geographical Knowledge and Discovery.**

Growth of Geographical knowledge ; Voyages and maritime discoveries ; Modern exploration in Asia, America and Africa ; Polar and Himalayan Expeditions.

**Books recommended—**

WARMINGTON : Ancient Explorers.

BURTON : Discovery of the Ancient World.

NEWTON : Travel and Travellers of Middle Ages.

NEWTON : The Great Age of Discovery.

SYKES : A History of Exploration.

DICKINSON and HOWARTH : Making of Geography.

DICKINSON and HOWARTH : The Background of Geography.

**Paper IV.—Practical.**

1. SURVEYING—Chain; Plane-table: Prismatic Compass; Clinometer.

2. MAP WORK : [1] Map Projections.

[2] Interpretation of topographical and Climatological maps.

[3] Preparation of Geographical and climate, Economic and population maps.

[4] Large scale maps of the following regions to be studied in detail:—

[a] Mount areas Kashmir :

[b] PLAIN REGIONS: A 1 1 1



[c] DESERT REGIONS : Dhar.

[d] DELTA REGION : Sunderbands.

3. Interpretation of Weather Charts.

Contour and Diagrams of Major Land-forms.

Books recommended—

HINKS : Maps and Survey.

STEERS : Map Projections.

BYGOTT : Map and Map work.

H. M. STATIONARY OFFICE : Weather Map.

ORMSBY : Mathematical Geography.

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## B. T. EXAMINATION—1948.

### Paper I.—Principles and Psychology of Education.

#### SECTION A.

1. Critical examination of the following aims of education: Learning, Morality, Culture, Individuality, Citizenship. What should be the aim of education in India in the light of the special features of the Indian situation?

2. Agencies of Education:

(a) Formal: The School.

(b) Informal: The Home, the Community, Religion, the State.

#### SECTION B.

1. Psychology and its bearing on Education: modern methods of psychological study as applied to Education—introspection, observation, experiment and psycho-analysis.

2. Heredity and environment as factors in education.

3. The psychology of instincts and emotions: sublimation; bearing of the psychology of instincts on intellectual and moral education.

4. General innate tendencies: suggestion, imitation, sympathy and play, their educational uses.

5. Psychology of character:

I. Innate bases of character:

(a) Disposition, methods of balancing it.

(b) Temperament, and its modification.

(c) Temper.

II. Acquired elements of character.

III. Principles and methods of Moral Education.

6. Psychology of the Unconscious and its educational implications

7. Attention and Interest: Causes of inattention: methods of arousing interest

8. Psychology of Cognition. Sensation and Sense Training; perception and the training of observation; imagination and reasoning—their educational uses and training.

9. Memory, and its effective use in education.

10. Learning and its laws; fatigue; transfer of training.

11. Stages of development, educational implications of the Psychology of adolescence.

12. Intelligence—Spearman's. . . Two Factor Theory ; Measurement of intelligence ; Methods of dealing with the backward child ; Achievement, Tests and Tests of emotion and character.

Books prescribed—

- ROSS : Groundwork of Educational Psychology.
- NUNN : Education, Its Data and First Principles.
- KENNED FRASER : Psychology of Education.
- RAYMONT : Modern Education.
- RYBURN : The Progressive School.

Books recommended for reference—

- OLIVE WHEELER : Creative Education and the Future.
  - JHA : Modern Psychology.
  - THOMSON : Instinct, Intelligence and Character.
  - DUNVILLE : Fundamentals of Psychology.
  - DOUGALS AND HOLLAND : Fundamentals of Educational Psychology.
  - STURT AND OAKDEN : The Psychology of Education.
  - MCDUGAL : The Energies of Men.
  - AVERILL : Elements of Educational Psychology.
  - C. MILLER : The New Psychology and the Teacher.
  - M. J. MUKERJEE : Indian Adolescence.
- Paper II —School Organization and Hygiene.

1. *School site, plans and equipment for different types of schools*—School site ; principles governing the construction of school buildings ; types of school buildings, equipment and furniture suited to each type ; use of the Hall ; rooms for special subjects, especially for science, drawing, geography, etc. ; types of schools ; large, small urban, small town, large town, boys' and girls'.

2. *Local Educational System*—The educational system of Ajmer-Merwara : classes and grades of schools for general education curricula and aims.

3. *Staff*—The headmaster and the school staff ; distribution of work ; subject and class-teachers.

4. *Time tables*—Arrangement and balance of subjects ; variations to suit special needs.

5. *Classification and Promotion*—Classification of schools ; methods of testing progress in various subjects and at different times, class records and promotion ; conduct of examinations.



teeth, skin, nose and throat). Causes of fatigue and the importance of rest. Common minor ailments, their identification and treatment. The problem of malnutrition and diet. Infectious diseases (including leprosy and tuberculosis). Disinfection.

Books prescribed —

BRAY : School Organization.

RYBURN : The Organization of the Schools in India.

MUKERJEE : Secondary School Organization.

SMITH : Hygiene for Schools.

AVERY : Text-Book of Hygiene.

LYSTER : Hygiene of the School.

Books recommended for reference—

BAGLEY : Class-room Management.

BAGLEY : School Discipline.

SMITH : Constructive School Discipline.

BENNETT : School Efficiency.

JOHNSON : The Administration and Supervision of the High School.

RAYMONT : Modern Education.

Pamphlets on School Organization (Gulab Singh & Sons, Lahore).

The Educational Code of the Province.

MACCARRISON : Food.

Paper III.—Method of Teaching.

#### PART I.

##### General.

Subjects of the curriculum and reasons for their inclusion their relative importance at different periods of school life ; correlation of subjects ; variation in curricula to meet the needs of various types of schools, and scholars of different ages—the Primary, Middle, High and Intermediate stages. Transition.

Methods of teaching in general, Inductive and deductive methods. Heuristic method, The collective lesson, individual teaching, teaching in sections, group work, and individual work, exposition and explanation, questioning and answering dealing with answers methods of dealing with mistakes, oral, written, or in construction, etc. narration and description, illustrations and illustrative aids ; use of the blackboard, diagrams ; relations between the scholar's own work and that of the teacher ; encouragement of private study and indivi-

dual work by the pupil; differences in methods according to the stage of the pupil; Recent developments in methods. Montessori; Dalton Plan; Playway, Project method, etc.

Schemes of work—their preparation and methods of working out; single lessons and series of lessons; notes—full and working notes; revision methods and values.

## PART II.

Methods of teaching the various subjects of the curriculum of Secondary Schools in India. Provision and use of apparatus.

(i) English—Early training in speech. Phonetics and its use, direct method Basic English. Reading at various stages; rapid reading: silent and oral reading: test work. Consideration of the subject taught as a "foreign" language. Dictation, transcription and composition, oral and written. The teaching of writing. Correction of work, Literature—its place; appreciation. The teaching of prose and poetry in the three stages. Grammar; Translation; the place of the mother tongue in teaching English.

(ii) History—Why History should be taught in school. work at different stages and selection of materials for each stage; essentials of teachers' and pupils' work, making the Past real through proper emphasis on movements, history room; the teaching of civics; Modern Developments and the teaching of History in school.

(iii) Geography—The Modern conception of Geography: the place of Geography in the school curriculum; different stages and work at each stage; Story and Regional Methods; the place of pictures, models, sketches and other material aids; correlation of Geography with other subjects: specially with Nature Study and hand-work. The Home Region. Geographical Excursions; Use of Maps.

(iv) Mathematics—Methods and apparatus, the teaching of principles; application of principles; practical, oral and written work. Correction of work. Means of securing accuracy.

(v) Science—Place of investigation and of information indoor and outdoor work; books and their use; biography. selection of material for schools differently situated, connection with gardening; excursions.

(vi) A Modern Indian Language—Means, of securing accurate hearing and clear articulation through phonetics and drill; the use of stories, oral and written composition, reading aloud, silent reading; recitation, training in the use of books, texts and more detailed study; grammar and its place; rapid reading; cultivation through prose and poetry of a taste for literature; Place of memorization in literature teaching; Aids to teaching. The teaching of calligraphy and prosody.

Books recommended—

(a) *General*

DAVIS : The Young Teacher's Primer.

GREEN and BIRCHENROUGH : A Primer of Teaching, Practice.

NANCY CATTY : A First Book of Teaching.

KENNEY : The Teacher in the Making.

OAKDEN and STURT : Matter and Method in Education.

RAYMONT : Principles of Education; Chapters XI and XII

RAYMONT : Modern Education, Chapters VI and VII.

SMITH and HARRISON : Principles of Class Teaching, Chapters XIII and XIV.

F. B. KHAN and M. SAXEN : Modern Educational Development.

(b) *Special Methods*

Suggestions for the consideration of Teachers (Board of Education).

WELTON : Principles and Methods of Teaching.

MC NEE : Instruction in Indian Secondary Schools

ADAMS : Modern developments in Educational practice.

BOSSING : Progressive Method of Teaching.

ADAMS : Student's Guide.

paper IV.—History of Education.

*A. Western Education*

The influence of the following educators on modern educational thought and practices :

1. Rousseau.
2. Pestalozzi.
3. Froebel.
4. Herbert.
5. Spencer.
6. Dewey.

Books recommended.

GRAVES : A Student's History of Education.

NURULLAH and NAIK : A Student's History of Education in India (Macmillan)

DEWEY : (1) The School and Society (?) The School and the Child

MONROE : A Brief Course in the History of Education.

BOYD : History of Western Education.

### B.—Indian Education.

A general review of Education in India from the beginning of the nineteenth century to the present day with reference to the following :—

The Orientalist Policy up to 1835.

Orientalist *versus* Anglicist Controversy, 1835.

The Despatch of 1854.

Educational Development from 1854 to 1882.

The Commission of 1882 and its results.

The Foundations of the universities and their influence on Secondary Education.

University Reforms 1904—C6.

Beginning of Compulsory Primary Education and subsequent developments in Primary Education.

The Calcutta University Commission and its main recommendations about Secondary and University Education.

The Indian Statutory Commission

Interim Report, 1929.

Abbott Wood Reports.

Experiments in National Education.

Present developments and trends—Education of

Women, Adult Education, Basic Education, etc.

Books prescribed—

SIQUEIRA : Education of India.

KEAY : Indian Education, Ancient and Modern.

JAMES : Education and Statesmanship in India.

Books recommended for reference—

MESTON : Indian Educational Policy

MAYHEW : Education of India (selected chapters).

PARANJPA : A Source Book of Indian Education.

SADLER : Calcutta University Commission Report.

Hartog Committee Report.

FLEMING : Schools with a Message in India.



VERKES : Wardha Scheme.

Quinquennial and Annual Reports of Education.

SARGENT : Economics of Education, with special reference to Indian problems.

Paper V. (a) *Special Method Course in English.*

1. The Place of English in the Indian Schools as a subject and as a medium of instruction.
2. The Direct Method of Teaching English.
3. Basic English : its merits and demerits.
4. Pronunciation, Handwriting and Spelling
5. Intensive study of prose and poetry.
6. The Rapid Reading lesson.
7. Grammar
8. Translation
9. Composition, oral and written.
10. Inspirational teaching

Books recommended—

PALMER : Principles of Language study.

WYATT and THOMSON : Teaching of English in India.

RYBURN : Teaching of English.

O'GRADY : Modern Language Teaching.

CHAMPION : Teaching of English.

TOMKINSON : Teaching of English.

OGDEN : Basic English.

Board of Education ; Suggestions for the consideration of teachers.

FINCH : How to Teach English Composition

MENZEL : Suggestions for the teaching or reading in India, (O. U. r.)

(b) *Special Method Course in History.*

1. Detailed Study of the following:—

- A. Meaning and Significance of History in School curriculum.
- B. Aims of Teaching History,
  - (1) In the Primary and Middle Schools.
  - (2) In the higher classes.
- C. Syllabus in History at different stages of School Education.
- D. Methods of Teaching History.
  - (1) Meaning and importance of the progressive *versus* regressive, periodic *versus* concentric and topical

*versus* chronological order of treatment, their merits and demerits.

- (2) Place of the text-book and oral lessons. The dramatic narration.
- (3) Place of standard and reference books in the teaching of History.
- (4) The Source Method—its advantages and limitation—its possible use in the Indian schools.
- (5) The value of illustrations, maps, diagrams sketches, historical visits
- (6) Expression work in History for junior and senior classes. F. I Correlation of History with—
  - (a) Literature.
  - (b) Geography.
  - (c) Manual Work, and
  - (d) Other subjects

- II. Written and practical work to be done by the students :—
- (a) Maps, diagrams and models.
  - (b) Lesson notes and essays.
  - (c) Drawing and collection of various kinds of historical illustrations and charts.
  - (d) Collection of sources to illustrate certain topics.

Books recommended—

DRUMMOND : History in Schools

KEATING : Studies in the Teaching of History.

FIRTH : Learning of History.

JARVIS : Teaching of History.

MACKENZIE : Instruction in Indian Secondary Schools.

MCNEE : Instruction in Indian Secondary Schools.

Memorandum on the Teaching of History.

(c) *Special Method Courses in Geography.*

#### THEORETICAL WORK

- A. Place of Geography in the School curriculum.
- B. Methods of teaching Geography in (a) the Primary. (b) Middle and (c) High School classes.
- C. Syllabus for (a) the Primary, (b) Middle (c) Matriculation and (d) Intermediate stages.
- D. Use of illustrative aids, text-books, statistics.
- E. Correlation with other subjects, specially with Science, Nature Study and History.
- F. Equipment of the Geography Room, Apparatus and Appliances. The Geography Library, Museum, etc.

*Practical work.*

1. A few maps of topical interest or possessing other features of interest.
2. Diagrams (on the black board as well as in the student's note books) illustrating such topics as revolution, seasonal migrations of the thermal equator, Wind Belts, etc.
3. Record of Weather observations.
4. Two criticism lessons by each student.
5. A course of at least 15 lessons by each student.
6. Drawing up a scheme of lessons on geographical topics for the Middle or High Departments with notes of lessons.
7. Attempting a few Geographical pictures.
8. Clay models, cardboard models and plasticine models of objects of geographical interest.
9. Drawing up detailed syllabuses of work for the Middle and High School classes.
10. Essays on subjects of geographical interest to be discussed in the tutorial classes.
11. Plane Table Survey.
12. Training in the use of projection lantern and slides.

*Books recommended—*

GARRET : Fundamentals of School Geography.

FAIRGRIEVE : Geography in School.

BAKKER : Geography in Education and Citizenship.

Memorandum on the Teaching of Geography (Phillip).

ARCHER, LEWIS and CHAPMAN : Teaching of Geography in Elementary Schools.

WALLIS : Teaching of Geography.

Suggestions for the consideration of teachers (Board of Education), latest edition.

STAMP : How to teach Geography.

(d) *Special Course in Mathematics.*

1. Place of Mathematics in the school curriculum
2. Methods
  - (a) Analytic and synthetic methods.
  - (b) Deductive and inductive methods.
  - (c) Heuristic and laboratory methods.
3. Material equipment—library and apparatus.
4. Curriculum in Mathematics :
  - (a) Syllabus for different stages.
  - (b) Practical and Mental Mathematics.

5. Teaching of Arithmetic, Algebra and Geometry, Aims, Methods, subject matter, correlation with one another and with other subjects.

6. The teacher of Mathematics—his qualifications and preparation.

Books recommended—

*For intensive study—*

YOUNG : The Teaching of Mathematics.

*For extensive and general study—*

KAPPUSWAMI IYENGAR : The Teaching of Mathematics in New Education.

HEMINGS : The Teaching of Arithmetic and Elementary Mathematics.

SMITH : The Teaching of Elementary Mathematics.

SCHULTZE : The Teaching of Mathematics in Secondary Schools.

Special Reports on Educational subjects: Mathematics, Vol. XXVI, Board of Education, England.

SMITH : The Teaching of Geometry.

NUNN : The Teaching of Algebra.

BALLARD : Teaching the essentials of Arithmetic.

(c) *Special Course in Physics and Chemistry.*

A. *Theoretical.*

1. Place of Science in the school curriculum.

2. Methods of Teaching Science with special reference.

to—

(a) The Heuristic and Laboratory Methods.

(b) The Concentric Method.

3. The Science room and the laboratory—their equipment.

4. Curriculum in Science :

(a) Syllabus for the Middle, High School and Intermediate sections.

(b) Instruction in the class room—experimental demonstration.

(c) Instruction in the laboratory—value of laboratory work, note-books, technique of laboratory management.

5. Teaching of Physics and Chemistry ; Aims, methods, subject matter, correlation with other subjects, applications to everyday life.

6. Science teacher—his qualifications and preparation : science library.

*B. Practical.*

1. A course of 15 typical experiments from the High School and Intermediate syllabus in Physics and Chemistry.
2. Elementary glass blowing ; fitting up apparatus.
3. Preparation of a piece of simple apparatus involving wood-work.
4. Preparation of models, charts, graphs, etc.
5. Some useful laboratory arts preparation of varnishes, silvering glass electroplating, etc.

6. Study, manipulation and use of the following:—

- (a) The gas plant.
- (b) The optical lantern and epidiascope.
- (c) The motor and dynamo
- (d) Electric bell installation.
- (e) Electric light installation.
- (f) Telephone installation.

7. Excursions to : (i) Power House, (ii) Ice Factory, (iii) Railway Workshop (iv) Water Works, (v) Flour Mill.  
Books recommended—

WESTAWAY : Science Teaching.

BROWN : Teaching Science in Schools.

SMITH and HALL : Teaching of Chemistry and Physics.

GHOSHAL : Manual of Science, Parts I and II.

Board of Edn., London : Suggestions for Teaching Science.

(f) *Special Course in General Science*, (Physics, Chemistry, Nature-Study and Gardening).

1. Aims and Values of the subjects
2. Organization of syllabuses. The place of Nature-study and general science in the school curriculum.
3. Methods of teaching.
4. Correlation of science subjects with one another and with other school subjects.
5. Planning of lesson notes.
6. Aids in teaching—the laboratory, the Science library, the school garden, the school museum and field trips.
7. Equipment of the Laboratory and the lecture room.
8. The place of excursions and gardening in Science

## *Practical Work.*

1 At least 15 lessons under the guidance of the teacher-in-charge.

### 2 Laboratory Work—

- (a) A course of typical experiments from the High School subjects in Elementary Science of the Rajputana Board.
- (b) Preparation of models and apparatus.
- (c) Methods of collecting and preserving animals and plants. The school aquarium and vivarium.
- (d) Collection and miscellaneous work.

Books recommended—

WESTAWAY : Science Teaching.

JOHN BROWN : Science Teaching.

WYSS : The Teaching of Nature Study.

RENNIE : Nature Study ; its aims and methods.

IRWIN : Practical Home Gardening for India.

- (g) *Special Course in Anatomy and Physiology of Human Body and Hygiene.*

### *Section A.*

1 Reasons for the inclusion of Anatomy and Physiology of the Human Body and hygiene in the curriculum ; methods of teaching the subject ; applications to daily life ; correlation with other subjects.

Aids to teaching ; selection and purchase of apparatus ; home made apparatus ; library books and charts ; care and arrangement of apparatus ; school museum ; the laboratory and its equipment

2 Sufficient acquaintance with the following topics to allow understanding of physiological processes ; solutions including colloidal solution ; diffusion ; permeability of membranes ; osmotic pressure ; carbohydrates, fats and proteins. Rate of chemical change ; catalysis.

Anatomy ; The human body in its entirety ; the skeleton ; muscular ; digestive ; circulatory ; respiratory ; excretory ; reproductive ; nervous and endocrine systems. The candidates should have sufficient acquaintance with the human skeleton and muscles to understand the mechanical principles of movements and the relations of muscles to the skeleton. A detailed knowledge of the morphology and nomenclature of the bones and muscles will not be expected.

A general acquaintance with the physiology of the following systems; Digestive; circulatory; respiratory; excretory; reproductive, nervous; and endocrine.

### 3 Practical Work:

(i) Microscopical study of the following animal tissues, from fresh preparations:—muscle, nerve, cartilage, blood and connective tissue.

(ii) General dissection of the various systems of a mammal (Rabbit, rat, or squirrel).

Preparation of lesson notes; maintenance of records;

Preparations of charts; models and graphs; preservation of dissected specimens.

### Section B.

#### Hygiene.

Air: Composition of air; ventilation and importance of pure air; diseases caused by impure air.

Water: Composition of water, sources of water supply, how water is polluted, purification of water.

Food: Composition of food, preservation of food, cooking of food.

Health and Infection: Infectious diseases, their methods of communication, precautions against diseases.

Personal Hygiene: Cleanliness of body (hair, nails, teeth, skin, nose, throat etc.). clothing, exercise, the use of drugs, spicing.

Books recommended—

WESTAWAY: Science Teaching, Chapter on the teaching of Biology.

ETHEL POULTON: The Teaching of Biology.

HUXLEY: Physiology.

CHARLES BANKS: Physiology, Public Health and Psychology.

C. BERESFORD: Elementary Hygiene for India.

BEST AND TAYLER: The Human Body and its Functions.

SMITH: Hygiene.

The paper will be divided into sections A. and B. Candidates will be required to attempt four questions from Section A. and two from Section B.

*(h) Special Method Course in Urdu and Hindi.*

- 1 Aims of teaching the mother tongue.
- 2 Study and criticism of present-day-methods of teaching the mother tongue.
- 3 The place of Grammar in the teaching of the mother tongue.
- 4 Selection of text-books and school literature.
- 5 Teaching prose :
  - (a) Study of the various forms of prose.
  - (b) Study and Investigation of the methods of teaching prose.
- 6 Teaching of poetry
  - (a) Study of the various forms of poetry.
  - (b) Study and investigation of the Methods of teaching poetry.
- 7 Appreciation of literature.
- 8 Teaching of composition.
- 9 Correlation among the various sub-divisions of the subject and with other subjects.
- 10 Present day trends and tendencies in literature.

Books recommended:—

BALLARD : Teaching the Mother Tongue.

BALMER : Principles of Language Study.

Board of Education : Suggestions for the consideration of teachers, chapter on the Teaching of English.

Assistant Master's Association : Memorandum on the Teaching of English

WEST : Language in Education.

CHATURVEDI : Bhasha ki Shiksha.

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B. SC. EXAMINATION—1949  
MATHEMATICS

There will be *three* papers—

I. (a) *Algebra*.—Inequalities, Simple continued fractions, Elementary theorems on convergence and divergence of series; Binomial theorem for any rational index; Exponential and logarithmic series; Partial fractions and easy determinants.

(b) *Analytical Geometry*.—Straight line, circle, parabola, ellipse, hyperbola and the reduction of the general equation of the second degree to standard forms. The above to be treated by rectangular and polar co-ordinates only.

(c) *Trigonometry*.—Inverse trigonometrical functions, De Moivre's theorem, summation of trigonometrical series, hyperbolic functions, expansion of trigonometrical functions.

II (a) *Differential Calculus*—Limits, differentiation of a function of a single variable, successive differentiation, use of Taylor's and Maclaurin's theorems, indeterminate forms, maxima and minima for a single variable, partial differentiation, tangents, normals, a symptotes, double points, curvature, envelope and simple curve tracing.

(b) *Integral Calculus*.—Standard forms, methods of substitution, Integration by parts and easy reduction formulae, Rectification of plane curves, quadrature, surfaces and volumes of solids of revolution.

(c) *Differential Equations*.—Ordinary differential equations of first order and of first degree and linear equations with constant co-efficients.

III (a) *Statics*—General conditions of equilibrium of a particle and of a rigid body under the action of forces in one plane, virtual work, friction, centre of gravity, common catenary, Hook's Law.

(b) *Dynamics of a Particle*.—Velocity and acceleration, Newton's Laws of motion, work and energy, rectilinear motion, projectiles in vacuum, circular and harmonic motions, simple and cycloidal pendulums, impact

(c) *Hydrostatics*.—Fluid pressure, pressure on immersed surfaces, conditions of equilibrium of a floating body centre of pressure.

## PHYSICS

The examination will consist of two papers and a practical test. Candidates must obtain minimum pass mark in the practical examination as well as in the total of the theory papers.

The subject of the papers will be—

Paper I. General Properties of Matter, Sound and Heat.

Paper II. Light Electricity and Magnetism.

The following is the detailed syllabus:—

**General Properties of Matter.—Rotation of Rigid Bodies:—**

Torque. Moment of Inertia and its calculation about any axis in the case of bar, disc, cylinder and sphere. Angular momentum and kinetic energy. Simple harmonic oscillations of a rigid body. Torsional and compound pendulums. Experimental determination of moments of inertia.

**Universal Gravitation:** Attraction of sphere and spherical shell on external and internal points. Gravitation constant and its determination. Experiments of Cavendish. Boys and Poynting. Determination of 'g' by Katers' pendulum. Effect of latitude, altitude and depth on the value of 'g'.

**Elasticity:** Definitions of elastic constants and their inter-relations. Poisson's ratio. Torsion of a cylinder. Bending of a bar supported at the ends. Experimental determination of elastic constants.

**Viscosity:** Determination of viscosity of a liquid by flow through a capillary tube.

**Surface Tension:** Angle of contact. Rise of liquid in a capillary tube. Pressure inside a spherical bubble or drop. Jäger's method of measuring surface tension.

Modern high vacuum pumps. Macleod gauge. Elementary principles of the flight of an aeroplane. Units, dimensions and dimensional equations.

**Sound.**—Mathematical theory of the following with application to sound:—

Equations of simple harmonic, damped and forced vibrations. Resonance. Composition of simple harmonic vibrations. Beats. Lissajous' figures. Fourier's Theorem. Equation of a wave. Reflection and refraction of waves. Interference of waves. Stationary waves. Vibrations of strings and tubes. Calculation of velocity of longitudinal waves in

a gas and transverse waves in a string. Doppler's principle. Measurement of frequency and of the velocity of Sound. Musical sounds and noise. Musical scales and Temperament. Common musical instruments—Harmonium, Sitar, Violin and Tabla.

Recording and reproduction of sound in gramophone and talkies. Microphone and loudspeaker.

Elementary ideas of the acoustics of buildings (non-mathematical).

**Heat.**—Mercury, gas and electrical thermometers and their corrections. Standard Thermometers. Measurement of high and low temperatures. Expansion of solids, liquids and gases. Calorimetry, ice, steam and continuous flow calorimeters. Specific heat of gases and their measurement. Equation of adiabatic change and determination of ' $\gamma$ '. Vapour pressure and its determination. Triple point. Refrigeration. Theory of the porous plug experiment. Liquefaction of gases. Conduction. Continuous flow of heat through a bar. Measurement of conductivity of solids. Radiation. Measurement of radiant heat. Black body, Stefan's Law, Solar constant and temperature of the Sun. Radiation pyrometers.

Kinetic theory of matter. Derivation of the gas laws. Ratio of specific heats of perfect gases. Vander Waal's equation. Critical constants. Continuity of state.

The two laws of Thermodynamics. Determination of ' $J$ '. Carnot cycle and efficiency of heat engines. Steam and internal combustion engines. Absolute scale of temperature. Entropy. Calculation of change of entropy in simple cases. Maxwell's four thermodynamic relations and their important applications. Specific heat of saturated vapours.

**Light—Geometrical :** Combination of thin lenses, Cardinal points. Spherical aberration and methods of minimising it. Chromatic aberration. Achromatic combination of lenses and prisms. Direct vision spectroscope. Ramsden and Huyghen's eye pieces. The eye and defects of vision. Spectrum and Spectrographs. Elementary ideas of the ultra violet and infra-red portions of the spectrum. Line and band spectra. Balmer series. Colour photography and tricolour printing.

**Physical :** Corpuscular and Wave theories of light. Huyghens' principle. Explanation of reflection, refraction

and rectilinear propagation of light. Interference. Biprism. Newton's rings and colour of thin films. Michelson's interferometer. Diffraction by a straight edge, thin wire, rectangular aperture and circular disc or hole. Resolving power of a lens and its application to telescope and microscope. Plane diffraction grating. Its dispersive and resolving power of a prism. Polarisation of light. Theory of double refraction in uniaxial crystals. Circularly and elliptically polarised light. Rotation of plane of polarisation. Half shade polarimeter.

**Electricity and Magnetism.**—Magnetic field and potential. Potential and force due to a small magnet and a magnetic shell. Action of one magnet on another. Magnetic induction. Susceptibility and permeability. Hysteresis. Para—dia—add ferro—magnetism. Terrestrial Magnetism. Determination of  $H$ ; and dip.

Electric field and potential. Calculation of potential and force in simple cases. Gauss theorem and its applications. Force on the surface of a charged conductor. Tubes of force. Energy of the electric field. Capacity of spherical cylindrical and parallel plate condensers. Dielectric constant. Quadrant and attracted disc electrometers. Electrostatic units and their relations to absolute and practical electro-magnetic units. Primary, secondary and standard cells. Magnetic fields, due to electric currents. Force on electric currents in a magnetic field. Different types of galvanometers, voltmeters. Ammeters and Wattmeters, Ballistic galvanometer. Kirchhoff's laws and their application to Wheatstone's net Carey Foster's bridge. Measurement of high and low resistances. Potentiometer. Electrolysis. Joule's law. Thermo-electricity, Peltier and Thomson coefficients and their relation to thermo-electric power. Piezo-electric effect. Electro-magnetic induction. Self and mutual inductance. Growth and decay of currents. Induction Coil. Elementary theory of dynamos and motors. Alternating currents, Impedance and reactance. Power factor. Choke Coil Transformer. A. C. Ammeters and Voltmeters. Charge and discharge of a condenser. Electric oscillations. Generation and detection of electro magnetic waves. Three electrode valve. Characteristic curves. Simple receiving and transmitting sets. Discharge of electricity through gases. Cathode rays. Positive rays. Determination of  $e/m$  and charge of electrons. Production of X-rays. Photo electric effect and the Principle of talking pictures. Elements of

radio activity. Isotopes, General ideas of Proton, Neutron, Positron and atomic structure.

**Experiments in practical.**

1. Searle's method for Young's modulus and modulus of torsion.
  2. Young's modulus by bending of a bar.
  3. Determination of Moments of Inertia.
  4. Surface Tension by a Capillary tube.
  5. Modulus of Torsion by (a) Statical method  
(b) Dynamical method.
  6. Co efficient of viscosity of a liquid.
  7. Sonometer.
  8. Weight thermometer.
  9. Specific heat by method of cooling.
  10. 'J' by mechanical method.
  11. Sextant.
  12.  $\mu$  by Spectrometer.
  13.  $\mu$  by total reflection.
  14. Wave-length of light by Newton's rings.
  15. Wave-length of light by diffraction grating.
  16. Determination of H.
  17. Variation of magnetic field due to a circular current along the axis.
  18. Determination of specific resistances
  19. Resistance of a galvanometer by Thomson's method.
  20. Resistance of a coil by Mance's method.
  21. Resistance of Accumulators.
  22. Carey Foster's Bridge.
  23. Resistance by Potentiometer.
  24. Calibration of voltmeter and Ammeter by Potentiometer.
  25. Measurement of thermo e. m. f. by potentiometer.
  26. Ballistic constant of a galvanometer.
  27. Dip by earth inductor.
  28. Electro-chemical equivalent of copper.
  29. 'J' by an electrical method.
- And any five of the following : —
1. Surface Tension either by Jager's method or by the detachment of a plate
  2. Kundt's tube.
  3. Melde's experiment.
  4. Frequency of a fork by graphical method.
  5.  $\gamma$  by Clement and Desorme's method.

6. Conductivity of a metal.
7. Focal length and nodal points of a combination of two lenses.
8.  $\gamma$  by Biprism or Lloyds' mirror.
9. Resolving power of a telescope.
10. Photometry.
11. Strength of Sugar solution by a polarimeter.
12. Platinum resistance thermometer.
13. Conversion of a galvanometer into an ammeter or voltmeter.
14. Frequency of alternating current.
15. Determination of impedance.
16. Characteristic curve of a Triode valve.

### CHEMISTRY

The examination in Chemistry will comprise *two* papers and a practical examination. Candidates must obtain minimum pass marks in the practical examination as well as in the total of the theory papers.

The course prescribed for the Intermediate Examination together with the following :—

*Physical and Inorganic*—Atomic theory, Avogadro's hypothesis and its application. Determination of equivalents. Specific heats of elements and compounds. Isomorphism. The periodic classification of elements. Methods of determining atomic and molecular weights. Kinetic theory of gases, Law of mass action and its applications. Ionic theory of Solutions. Hydrolysis, osmotic pressure, vapour pressure, influence of solutes on freezing and boiling points. Law of electrolysis, electro-chemical equivalents, determination of conductivity and transport numbers. Avidity of acids and bases. Hydrogenion concentration and theory of indicators. Elements of catalysis, colloids, spectrum analysis, thermochemistry, atomic structure and its general relationship to periodic table, atomic numbers, radio-activity and isotopes. The relation of physical properties to chemical constitution. Elements of Phase Rule dealing with systems of one component only.

The occurrence, preparation and properties of the following elements and their important compounds, treated especially with regard to the periodic classification : (Outlines of metallurgical processes of the metals indicated by italics)—Hydrogen, Argon, Helium, Li, *\*Na*, *\*K*, *\*Cu*,

\*Ag, \*Au, Mg, Ca, Sr, Ba, Ra, \*Zn, Cd, \*Hg, B, \*Al, C, Si, Sn, \*Pb, N, P, As, Sb, Bi, O, S, Cr, F, Br, Cl, I, Mn, \*Fe, Co, \*Ni, and \*Pt. Principal chemical manures. Outline of the nitrogen cycle.

*Practical*—Qualitative analysis of mixtures of substances containing no more than *four* of the following radicals, positive or negative, by dry and wet methods—

NH, Na, K, Mg, Ca, Sr, Ba, Zn, Mn, Ni, Co, Al, Cr, Fe, Cr, Bi, Hg, Cd, As, Sb, Sn, Pb, Ag, CO<sub>3</sub>, S, SO<sub>3</sub>, SO<sub>4</sub>, F, Cl, Br, I, NO<sub>2</sub>, NO<sub>3</sub>, ClO<sub>3</sub>, also borate, acetate, oxalate, phosphate.

Acidimetry and alkalimetry iodometry using thiosulphate, arsenite, permanganate, dichromate and copper sulphate. Titration of iron with potassium permanganate and dichromate standardization of permanganate by oxalic acid. The volumetric determination of silver as chloride and as thiocyanate.

Gravimetric estimation of Ba, Cu, Ag, Pb, Zn Fe, chloride and sulphate.

*Organic*—The rise, the development and the characteristics of organic chemistry. Methods of purification and tests of purity of organic substances, Methods of ultimate analysis, qualitative and quantitative. Determinations of empirical formula and molecular weights. Structural formula. Homology and Isomerism. The occurrence, the Preparation, the properties and the structure of the following :—

Acyclic hydrocarbons, (saturated up to pentane and unsaturated (the first members). The petroleum industry. Halogen derivatives, mono, di, tri-tetra, etc.

Alcohols saturated (the first four). industrial alcohol, (fermentation and elementary knowledge of enzymes yeast, bacteria and moulds, glycol, glycerol and their derivatives. Manufacture of glycerol and its nitrates.

Ethers. Aldehydes and ketones.

Monobasic fatty acids : saturated (up to butyric) Vinegar, soaps, candles, their manufactures, oils and fats. Acid halides, anhydrides, amides and esters.

Mercaptans.

Amines, nitro-paraffins. Cyanogen and derivatives Urea.

Organo-metallic compounds of zinc and magnesium.

Haloid acid, cyanacetic acids, amino-acids, Hydroxy-monobasic acids ; glycollic and lactic. Optical isomerism. Ketonic acids (aceto-acetic). Tautomerism.

Dibasic acids (carbonic, oxalic, malonic and succinic) and derivatives. Acids, malic, tartaric and citric.

Glucose, fructose, sucrose, starch and cellulose (only a general view of occurrence, properties and reactions) Manufacture of sugar, paper and cellulose derivatives.

Proteins, their occurrence and general characteristics in an elementary way.

Cyclic aromatic hydrocarbons, benzene, toluene and naphthalene. Coal gas and coal tar distillation, characteristics of aromatic compounds. The following derivatives of the above three hydrocarbons: the halogen, the nitro, the amino derivatives and the sulphonates. The Diazo reaction.

Phenol, catechol, resorcinol, pyrogallol, quinol and the naphthols, Benzyl alcohol, benzaldehyde, acetophenone, benzophenone, quinone, benzoic acid, benzoyl chloride. Salicylic and phthalic acids, Pyridine.

#### *Practical.*

*Systematic identification* of the following organic compounds, including (1) the determinations of their boiling or melting-points, (2) the detection of the elements contained, (3) the application of tests characteristic of the groups contained and of the compounds themselves and (4) wherever possible, the preparation of a solid derivative in a pure condition:—

Benzene, toluene, naphthalene, chloroform, iodoform, methanol, ethanol, Phenol, resorcinol, pyrogallol, formaldehyde, acetaldehyde, chloral hydrate, benzaldehyde, acetone acids formic, acetic, oxalic, succinic, tartaric, citric, benzoic, salicylic, ethyl acetate, ethyl benzoate, glucose, sucrose, starch, acetamide, urea, aniline, tribromaniline, acetanilide; nitro-benzene.

#### Books recommended—

Caven : Foundations of Chemical Theory.

Walker : Introduction to Physical Chemistry.

Caven and Lander : Systematic Inorganic Chemistry.

Smith and Kendall : Introduction to Inorganic Chemistry.

Partington : Text-book of Inorganic Chemistry.

Mellor and Parker : Modern Inorganic Chemistry.

Cohen : Theoretical Organic Chemistry.



Perkin and Kipping. Organic Chemistry, Parts I and II.  
 Ostwald : Foundations of Analytical Chemistry.  
 Caven : Qualitative Analysis.  
 Mollow Perkin : Qualitative Analysis.  
 Waters : Introduction to Practical Organic Chemistry.  
 Caven : Quantitative Chemical Analysis. (Part I)  
 Sarkar and Rakshit : Organic Chemistry for the B. Sc.  
 Pass Course.

## ZOOLOGY

The examination will comprise two papers and a *practical* examination. Candidates must obtain the minimum pass marks in the practical examination as well as in the total of the theory papers.

The following Syllabus is prescribed :—

The general principles of Biology treated in an elementary manner, comprising the theory of evolution with the general notions of variation, heredity and adaptation.

The elementary principles of the geological and geographical distribution of animals.

The structure and the phenomena of the animal cell.

Reproduction, sexual and asexual ; Parthenogenesis ;  
 Metamorphosis ; Alternation of generations.

The structure, habits, development and the economic importance (if any) of the non chordata as illustrated by—

Protozoa	Amoeba, Paramecium, Euglena and Malarial parasite
Porifera	Sycon or any other sponge.
Cœlenterata	Hydra, Obelia
Platyhelminthes	Liverfluke and Taenia.
Annulata	Pheretima, Neries and Leech.
Echinodermata	Starfish (general characters and external feature only).
Arthropoda	Prawn, (Locust if not available Cockroach) Anopheles, Housefly, and Scorpion. Cimex (bed bug), habits, habitat and external features.
Mollusca	A fresh water Mussel, and Pila or any other Pond Snail.

The principal characteristics, structure and habits of the Chordata as illustrated by—

*Acrania—*

- Hemichorda ...Balanoglossus,  
 Urochorda ...Herdmania or any other ascidian.  
 Cephalohorda ...Amphioxus.  
 Cyclostomata ...Petromyzon (external features only).

*Craniata—*

- Pisces ...Scoliodon or any other Elasmobranch  
 and external features of a bony fish (skeleton excluded).  
 Amphibia ...The Frog  
 Reptilia ...Hemidactylus or any other lizard.  
 Aves ...Columba. (The skeleton of Gallus may be substituted).  
 Mammalia —The general characters of the Prototheria and Metatheria, Lepus, Squirrel or Rat, Canis (skull only).

The outlines of the development of Ciona, Amphioxus, frog, chick and rabbit. Amnion and Allantols, Placentation.

The elementary physiology of the various organs of the animal body, as illustrated by the Frog and Rabbit

Paper I.—shall comprise the non-chordata, the structure of the animal cell, the subjects of Reproduction and Histology and the general principles of Biology.

Paper II.—The Chordata, Vertebrate Embryology, Physiology, Geological and Geographical distribution.

**Practical Course**

Candidates will be required to show a knowledge of simple microscopic technique and to dissect and describe the following animals.—

Amoeba, Paramoecium, Sycon, Hydra, Obelia. Pheretima Nereis, Leech, Starfish (external features only). Prawn, Cockroach, Scorpion, Unio, Pila, Balanoglossus (external features only), Herdmania, Amphioxus (dissection omitted), Scoliodon or any other Elasmobranch. Frog, Lizard Pigeon, and Rabbit, Squirrel or Rat.

Osteology of dogfish, frog, lizard, fowl, rabbit, dog's skull  
 Echidna (limbs and limb girdles only).

Note-books containing a complete record of laboratory work must be produced at the practical examination.

Books recommended—

Parker and Haswell : Text-book of Zoology, Vols. I and II (Macmillan)

Wiedersheim and Parker : Comparative Anatomy of Vertebrates.

Bourne : Comparative Anatomy of Animals, Vols I and II.

Parker and Bhatia : Text-book of Zoology for Indian Students.

Dendy : Outlines of Evolutionary Biology.

Marshall and Hurst : Practical Zoology (John Murray).

Thomson : Outlines of Zoology.

Kingsley : Comparative Anatomy of Vertebrates.

K. N. Bahl : Pheretima

E. M. Thillayampalam : Scoliodon.

Baini Prasad : pila.

Borradaile and Potts : Invertebrate.

S. M. Das : Herdmania.

Br. Mus. Nat. Hist. Economic Series No. 5—The Bed Rug.

## BOTANY

The examination will comprise *two* papers and *Practical* examination. Candidates must obtain minimum pass mark in the practical examination as well as pass in the total of the theory papers.

The following syllabus is prescribed :—

1. The anatomy including histology of the vegetative and reproductive organs of Phanerogams and Cryptogams treated from the comparative and functional standpoint.

A general knowledge of the plant-cell and plant tissues. The cell contents and their micro-chemical reactions.

2. The morphology, Physiology and life-histories of :  
*Thallophyta*—

(a) Bacteria,

(b) Algae—*Volvox*, *Ulothrix*, *Pleurococcus*, *Oedogonium*, *Vaucheria*, *Chara*, *Fucus*, *Polysiphonia*, *Oscillatoria* and *Nostoc*.

(c) Fungi—*Rhizopus*, *Cystopus*, *Saccharomyces*, *Marchella*, *Eurotium*, *Ustilago*, *Buccinia* and *Agaricus*.

*Bryophyta*—

- (a) *Hepaticæ*—*Riccia*, *Marchantia* and *Anthoceros*.  
 (b) *Musci*—*Funaria* or any other moss.

*Pteridophyta*—

- (a) *Filicinae*—*Equisetum*, *Aspidium* or other fern and *Marsilia*  
 (b) *Lycopodiinae*—*Selaginella*.

*Spermatophyta*.

- (a) *Gymnosperms*—*Cycas* and *Pinus*.  
 (b) *Angiosperms*—A detailed knowledge of the structure and life-history of a typical flowering plant and the characteristic features and economic importance of the following:—

## Families :—

*Ranunculaceæ*, *Papaveraceæ*, *Cruciferae*, *Capparidaceæ*,  
*Violaceæ*, *Caryophyllaceæ*, *Malvaceæ*, *Rutaceæ*,  
*Leguminosæ*, *Rosaceæ*, *Myrtaceæ*, *Cucurbitaceæ*,  
*Umbelliferae*, *Rubiaceæ*, *Compositæ*, *Apocynaceæ*,  
*Asclepiadaceæ*, *Convolvulaceæ*, *Solanaceæ*,  
*Acanthaceæ*, *Labiatae*, *Euphorbiaceæ*, *Musaceæ*,  
*Liliaceæ*, *Palmæ* and *Gramineæ*.

## 3. Vegetable Physiology—

- (a) An elementary knowledge of plant anatomy from the physiological stand-point.  
 (b) Nutrition—Chemical constituents of the plant; the essential constituents of plant food: the absorption of water and dissolved substances; water conduction; transpiration; the assimilation of carbon and nitrogen; the utilization and transference of the products of assimilation and reserve materials; special processes of nutrition.  
 (c) Respiration—General facts.  
 (d) Growth—General facts; the effect of external condition on growth.  
 (e) Movements—Protoplasmic movements; imbibition movements, heliotropism, geotropism, contact stimuli and their effects; movements of variation.  
 (f) Reproduction—Vegetative reproduction: sexual reproduction; including double fertilization; cross

and self-pollination, dispersal of fruits and seeds germination.

4. An elementary knowledge of variation, heredity, evolution and plant-breeding.

5. Elementary plant ecology.

Paper I.—shall comprise the Morphology and life-histories of Cryptogams and Gymnosperms.

Paper II.—shall comprise the Morphology, Physiology, and life-histories of Angiosperms, General Plant Physiology, General Biology and Ecology.

#### Practical Course.

The dissection of the plants and parts of plants. The preparation, staining and study of microscopical sections of plants and the principal varieties of plants tissues. The uses of stains and other reagents and the micro-chemical reaction of protoplasm starch, and cellulose with its derivatives.

A practical study of the typical plants enumerated under section 2 ; the referring of plants and parts of plants to their appropriate position in the given schedule of classification.

The description of plants and parts of plants in technical language.

Simple experiments in Plant Physiology.

Note Books containing a complete record of laboratory work must be produced at the *Practical* examination.

Books recommended—

Scott : Structural Botany, Vols. I and II.

Strasburger : Text-book of Botany.

Strasger and Hill House : Practical Botany.

Coulter, Barnes and Cowles : Text-book of Botany.

Wills : Flowering Plants and Ferns.

Cavers : Practical Botany.

Palladin : Plant Physiology.

Holman and Robbins : Text book of General Botany,

Gager : General Botany.

S. Ranjan : Plant Physiology.

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## GEOLOGY

There will be two papers, each of three hours duration and each carrying 50 marks. There will also be a practical examination carrying 50 marks 20 per cent. of the total marks in the Practical shall be assigned to the record of the candidate during the two sessions and the report of the field work done by him.

Paper I—Dynamical and Structural Geology, Palaeontology, and Historical Geology.

Paper II.—Crystallography. Mineralogy, Petrology and Economic Geology.

### Dynamical Geology or Physical Geology

The aims, methods, and application of Geology.

Elementary ideas about the origin, age and the interior of the earth. Nature of the earth's crust. Origin of continents and oceans.

Weathering of the earth's crust by rain, wind, heat and cold, frost, underground water, rivers, glaciers and the sea.

Transpiration by gravity, rivers glaciers and wind.

Deposition of the detritus. Terrestrial, palustrine, fluvatile, lacustrine and marine deposits.

Volcanoes—nature and origin, the phenomenon and its effects, connection with volcanoes

Evolution of surface—features by terrestrial agencies and river erosion. Formation of valley-systems. The effects of glaciation and wind-action on topography.

Physiographic features of India.

### Structural Geology

Stratification. Structures of sedimentary and igneous rocks.

Joints. Dip, strike and out crop. Folds. Faults and their effects on outcrops. Unconformity and its significance. Contour maps. The nature of outcrops in contour maps. Reading of simple geological maps and drawing of sections.

### Palaeontology

Conditions for the entombment of organic remains. Fossils, their character and modes of preservation. The value of

fossils as indices of age and climate. Morphology and geological distribution of the following groups of fossils :—

Actinozoa, Graptolitoidea, Crinoidea, echinoidea, brachiopoda, Lamellibranchiata, gasteropoda, cephalopoda and trilobita.

An elementary knowledge of the nature and distribution of vertebrate and plant fossils.

### Historical Geology

Principles of stratigraphy. Lithological and chronological sub-divisions of the geological record. The leading features and characteristic fossils of the different geological periods. The rock-formations of India and Burma treated in a concise manner.

### Crystallography

• Laws of crystallography. The six systems of crystallography. Important classes of symmetry. Weiss and Miller systems of notations. The contact goniometer. Twinning.

### Mineralogy

• Physical and chemical properties of minerals.

*The petrological microscope*

Optical character of minerals under the microscope in ordinary and polarized light.

Study of about 40 of the more important rock forming minerals with regard to their chemical composition, alterations, physical properties.

Crystallographical and microscopic characters, occurrence and commercial uses, if any.

Study of about 80 of the more common metallic and non-metallic minerals of economic importance with regard to their chemical composition, distinctive physical properties, blow-pipe test, occurrence, and economic uses.

### Petrology

Igneous and sedimentary rocks—their morphology, texture, modes of origin, and classification.

Metamorphism. Important types of metamorphic rocks.

Study of about 40 common rock types.

### Economic Geology

• Modes of occurrence, origin and classification of ore-deposits. Secondary enrichment. The Chief Metallic and non-metallic of economic importance found in India.

Coal and Petroleum. Water supply. Building stones.  
General principles of prospecting and development. Economic considerations on which the value of an ore-deposit depends.

### Practical Work

Reading of geological models showing physiographical and structural features.

Determination of density, hardness and fusibility of minerals.

Reading and making drawings of crystals of common minerals.

Examination of important rock-forming minerals in hand specimens and under the microscope.

Microscopic and megascopic examination of a representative collection of rock types and sections.

The study and drawing of specimens from a representative collection of fossils.

Blow-pipe test and hand recognition of economic minerals. Easy exercises on the outcrop of beds. Reading geological maps and drawing sections across simple geological structure.

### Books recommended —

W. B. Scott: An Introduction to Geology, Vol. I [Macmillan & Co.]

Platt and Challinor: Simple Geological Structures [Thomas Murby & Co.]

H. Woods: Palaeontology Cambridge University Press.

D. N. Wadia: Geology of India for Students [Macmillan & Co.]

N. L. Sharma: Mineralogy, Petrology and economic Geology [Ind. Soc. of Engineers, Calcutta].

N. L. Sharma: Notes on geological maps and section [Calcutta Geographical Society].

F. Rutley: Elements of Mineralogy, Revised by H. H. Read [Thomas Murby & Co.]

H. G. Smith: Minerals and the Microscope, [Thomas Murby & Co.]

G. W. Tyrell: The principles of petrology, [Methuen & Co.]

J. W. Gregory: The Elements of Economic Geology, [Methuen & Co.]

M. S. Krishnan: Introduction to the Geology of India.



## MILITARY SCIENCE

There will be two papers of 50 marks each and a *practical* test of 50 marks.

*Paper I.—Military Organisation, administration and tactics.*

*This will include—*

- (1) Infantry Battalion Organisation.
- (2) Infantry Weapons and their characteristics.
- (3) Organisation of the Navy, Army and Air forces in India
- (4) Reconnaissance and Protection.
- (5) Action against Tanks.
- (6) Defence against Air Attack.
- (7) Protection against Gas.
- (8) The duties of a Platoon Commander in Attack and Defence.
- (9) Verbal Orders, Reports and Messages.
- (10) Elementary Tactics.

*Reference books :*

1. Military Training Pamphlet 23, Part I.
2. Infantry Section Leading Pamphlet 14, 1942.
3. S. A. T Vol. I. Pamphlet No. 6
4. Hostile and Friendly Air Craft, 1942.
5. Military Training Pamphlet 33 Field Craft Elementary Tactics.
6. Military training Pamphlet 17, Defence against Airborne Troops, 1942.
7. Military Training Pamphlet, GAS TRAINING, 1942.
8. M. T. P. No. 16 (India) Platoon Leading in Frontier Warfare.
9. M. T. P. No. 30 Field Engineering. All Arms Part V. Protective Works.
10. Handling of Men.
11. The Officer and the Fighting and Efficiency.
12. Army in India Training Memoranda, periodically issued by the G. H. Q.
13. Field Craft and Battle Drill Chapters I, II and III.
14. KIRBY and KENNEDY : Tactical Schemes with solutions Series I and II.
15. PENDELBURY : Elementary Tactics.

*Paper II.—Military Law (Indian) Map Reading : Military Hygiene : and General principles of War in the Light of Mesopotamian Campaign by Wavel.*

**Reference Books—**

1. Manual of India Military Law (Government Publication).
2. O' Donnell : Manual of Indian Military Law.
3. I. T. F. Act and I. T. F. Regulations.
4. Hand-book of Military Hygiene, 1941.
5. Mesopotamian Campaign 1916—1918 by Wavel.

**Practical Test :** The candidate will be required to pass a practical test in Map Reading, Setting Map, Finding position on the Map. The use of Prismatic Compass and Service Protractor ; (b) T. E. W. T. or if suitable ground be not available by means of a Sand Table. Exercise in which the Candidate will act as a Platoon Commander (c) First aid to the Injured.

### ENGLISH

There will be *two* papers :—

Paper I.—Essay and Unseen.

(1) An essay designed to test the powers of the student to write clearly and correctly on (a) subject with which he may be expected to be acquainted and (2) an unseen passage from a modern book, magazine, newspaper, designed to test the candidate's knowledge and intelligent appreciation of present day topics and his ability to write a clear *precis* together with exercises on idiom.

Books recommended—

FOWLER : The King's English (O. U. P.)

FOWLER : Dictionary of Modern English Usage, (O. U. P.)

MILLER : Hints on the Art of English Composition in Prose and verse. (Gaya Prasad & Sons, Agra.)

Paper II.—General Composition.

Subjects for short essays will be set from the following books, which are not meant for detailed study :—

A. F. SCOTT : Modern Essays, Second Series, 1941—43 (Macmillan & Co.).

The Sections and Title 'Looking to the Future' 'Science' and 'The War' only are prescribed.

C. K. ALLEN : Democracy and the Individual (Oxford University Press).

DEAN INGE : Five Essays, edited by E. A. Wodehouse and published by Longmans Green & Co., Ltd.

One Act Plays of To-day, Series I (Harrap).

M. Sc. EXAMINATION  
MATHEMATICS

PREVIOUS.

(For the Examination of 1948).

Paper I.—(i) *Algebra*.—Convergence of infinite series and of infinite products, the expansion of sine and cosine in an infinite product.

Books recommended—

HOBSON *Plane : Trigonometry*.

BERNARD AND CHILD : *Higher Algebra*.

(ii) *Theory of Equations*.—General properties of equations ; relation between roots and co-efficients, symmetric functions of the roots, transformation of equations, algebraic solution of the cubics and biquadratics, sums of powers of roots. Sturm's theorem, approximate solutions of numerical equations ; determinants.

(iii) *Vector Analysis*—*Fundamental notions*, addition, subtraction and multiplication of Vectors, simple geometrical and mechanical applications.

Book recommended—

Weatherburn : *Elementary Vector Analysis*.

Paper II.—(i) *Differential Calculus*.

Taylor's theorem ; maxima and minima of functions of two or more variables ; definition of continuity and differentiability ; change of variables ; Jacobians.

(ii) *Integral Calculus*.—Improper integrals and simple tests for convergence of integrals definite integrals, including Beta and Gamma functions ; multiple integrals ; volumes and surfaces of solids ; use of Fourier's series.

(iii) *Differential Equations*—Ordinary equations of the first order ; general linear equations with constant co-efficients ; linear equations of the second order, including transformations to standard forms and variation of parameters ; homogeneous equations and exact

equation ; simultaneous differential equations with constant co-efficients : total differential equations, partial differential equations of the first order.

Paper III.—(i) *Analytical Geometry of three dimensions.*

Plane ; straight line ; reduction of the general quadratic equation to standard forms ; properties of a quadratic surface referred to its principal axes.

(ii) *Analytical Geometry of two dimensions.*

Homogeneous co-ordinates, tangential co-ordinates, families of conics, invariants and covariants.

Paper IV.—(i) *Analytical Statics.*—Strings in two dimensions ; centres of gravity ; virtual work ; stability ; systems of forces in two or three dimensions.

(ii) *Dynamics of a particle in two dimensions.*—Central forces ; motion in a resisting medium ; constrained motion ; hodographs and revolving curves.

### Final

(For the Examination of 1949)

The examination shall consist of four papers as follows :—

### Compulsory.

Paper I.—(i) *Theory of Aggregates.*—Cantor's and Dedekind's theory of irrational numbers ; arithmetical theory of limits ; linear sets ; limiting points and derivatives of point sets ; descriptive terminology of point sets ; enumerable aggregates ; power and content of an aggregate ; definition of measure.

(ii) *Theory of Function of a real Variable.*—Continuity and discontinuity of functions of a single variable ; properties of continuous functions ; Maxima and minima of a continuous function ; derivatives of functions ; Mean value theorems ; Riemann's integration ; Fundamental theorems in integral calculus.

(iii) *Theory of Function of a Complex Variable.*—Conformal representation of one plane on another ; integration of a regular function ;

Cauchy's theorem; residues: development in power series; Taylor's and Maclaurin's series and Laurent's series.

- (iv) Uniform convergence of series, products and integrals, including the continuity of sum function and term by term differentiation and integration of series.

Paper II.—(i) *Statics*.—Attractions and potentials of rods, discs and spheres; Gauss's, Laplace's and Poisson's theorems.

- (ii) *Rigid Dynamics in two and three dimensions*.—Moments and products of Inertia; Principle axes, Momental Ellipsoid and definition of ellipsoid of gyration. D. Alembert's principle; Motion about a fixed axis; centre of percussion, Motion in two dimensions, Principles of momentum and energy. Lagrange's equations in generalised co-ordinates. Euler's Dynamical and Geometrical equations.

Papers III and IV.—Any two of the following:—

- (i) *Spherical Harmonics*.—Linear partial differential equation with constant coefficients; Monge's methods; solution in series of Legendre's; Bessel's equations and hypergeometric series; solutions of Laplace's equation in spherical, cylindrical and ellipsoidal co-ordinates; expansion of a function to surface harmonics; application to potential problems.

Books recommended—

Macrobert: *Spherical Harmonics*.

Ganesh Prasad: *Spherical Harmonics*, Part I.

(ii)—*Hydromechanics*.

*Hydrostatics*.—Laws of fluid pressure: general conditions of equilibrium in a fluid; uniformly rotating liquid: equilibrium of floating bodies, including metacentric formulae, equilibrium of gaseous liquids (excluding capillarity and oscillation of floating bodies).

*Hydrodynamics*.—Lagrangian and Eulerian methods, continuity; bounding surface condition: velocity potential and current function: sources and sinks; motion of circular and

the elliptic cylinders in two dimensions, motion of a sphere in liquid : simple waves ; vibrations of a string and of air in tubes.

Book recommended—

Besant and Ramsay : Hydro-mechanics, Parts I and II,

(iii)—Elliptic Function and Vector Analysis.

*Elliptic Functions.*—General properties of elliptic function ; Weierstrassian and Jacobian elliptic functions, including the Sigma and Zeta functions ; elliptic integrals ; simple geometric and mechanical applications.

Books recommended—

Goursat : Mathematical Analysis.

Hancock : Elliptic Functions.

*Vector Analysis.*—The Scalar and Vector products of Vectors ; gradient of a scalar function and the curl and divergence of Vector functions. The line, space and volume integrals of Vector functions with the standard transformation formulae. The linear Vector function. Simple applications to differential geometry, attraction and potential.

Book recommended—

Weatherburn : Advanced Vector Analysis.

(iv)—Spherical Trigonometry and Spherical Astronomy.

Spherical Trigonometry, including the general properties of Spherical triangles.

Spherical Astronomy—Fundamental Instruments ; Celestial sphere ; Atmospheric refraction ; Precession and Nutation ; Time ; Ecliptic ; The Equation of Time. Aberration ; Parallax ; Eclipses ; Rising of the Sun and the Moon ; Twilight ; Determination of position on earth ; Planetary Phenomena.

Books recommended—

Smart : Astronomy.

Ball : Spherical Astronomy.

Todhunter and Leathem : Spherical Trigonometry.

(v)—Solid and Differential Geometry.

of quadrics ; surfaces and curves in space, in the associated developables and Frenet's formulae ; forms ; Gauss's characteristic equation and the

Mainardi Codazzi relations ; lines of curvature, conjugate lines ; asymptotic lines ; geodesics and geodesic curvature.

Books recommended—

Bell : Solid Geometry.

Forsyth : Differential Geometry (First three chapters).

Eisenhart : Differential Geometry.

(vi)—Complex Variable.

1. Meromorphic functions ; Rouché's, Hurwitz's, Jensen's, Carleman's and Littlewood's Theorems ; Poisson-Jensen Formula.

2. Analytic continuation ; simple properties of Gamma and Zeta functions. Hadamard's multiplication Theorem.

3. The maximum-modulus Theorem ; Vitali's and Montel's Theorems. Hadamard's three circles Theorem. Caratheodory's inequality ; the theorems of Phragmen and Lindelöf.

4. Conformal representation and simple functions.

5. Power series with a finite radius of convergence. Riesz-Fatou Theorem ; Over-convergence, Hadamard's gap Theorems ; Hardy Littlewood's Theorem ; Abel's Theorem and its converse ; Partial Sums of Power series.

6. Integral functions : Weierstrass's and Hadamard's Theorems ; Sterling's Theorem ; Theorems of Laguerre ; Borel's Schottky's Landau's and Picard's Theorems.

7. Dirichlet's Series : Simple properties of ordinary Dirichlet's Series

Book recommended—

E. C. Titchmarsh : The Theory of Functions (O. U.P.), 1932—Chapters III-IX.

(vii)—Mathematical Theory of Statistics.

General nature and scope of Statistical methods. Classification of Statistical data by categories and measurements. Frequency Distribution.

Measures of Central tendency ; Mean Median and Mode.

Measures of Dispersion—Standard Deviation.

Elements of the theory of probability. Addition and Multiplication Theorems. Mathematical Expectation.

Normal, Binomial and Poisson Distributions. Moments.

Elementary ideas of skew distributions.

General ideas of association and correlation. Co-efficient of correlation. Fitting of straight and curved regression lines.

Elements of Sampling Theory. Exact distribution of  $x^2$ ,  $t$ , and  $\gamma$ —statistics in Samples drawn from a normal population with application to the problem of the significance of the difference of the means based on large and small samples.

## PHYSICS

(For the Previous and Final Examinations of 1949).

The following is the detailed syllabus (in addition to what is included in the B. Sc. course):—

### Paper I—*Properties of Matter and Heat.*

Gravitation : Theory of compound pendulums. Kepler's Laws and Gravitation constant. Mass and density of earth. Elasticity : Moduli and their inter-relations. Bending of beams. Elastic curves and stability of pillars. Spiral springs. Compressibility and tensile strength of liquids.

Surface Tension. General theory. Waves and ripples. Spherical and cylindrical films. Drops. Vapour pressure over curved surfaces. Laplace's theory.

Viscosity of liquids and gases. Flow through capillary tubes. Lubrication.

Crystals : Symmetry and classification of crystals. Arrangement of atoms in lattices.

Kinetic Theory : Maxwell's law of distribution of velocities. Equipartition of energy. Mean free path. Viscosity. Conduction. Diffusion. Specific heat. Brownian motion. Molecular streaming. Effusion and vapour pressure of metal. Absolute manometer. Modern vacuum pumps and gauges. Molecular dimensions.

Thermodynamics : Laws of Heat engines. steam and internal combustion engines. Entropy. Applications of thermodynamics. Production of very low temperatures. Nernst's Heat Theorem.

Radiation : The laws of Stefan, Wien Rayleigh-Jeans and Planck. Radiation pyrometry. Temperature of the sun and stars.

Theory of Specific heats.  
Statistics : Statistical mechanics and entropy. General of Bose Einstein and Fermi-Dirac Statistics.



*Paper II.—Sound and Light.*

**Sound :** Fourier's Theorem and its application to plucked, struck and bowed strings. Noise and sound-level and their measurement. Pressure of waves. Acoustics of buildings. Supersonics. Acoustic impedance and filters. Absorption Co-efficients. Microphones, Loud-speakers. Recording and reproducing of sound. Photography of sound waves.

**Light :** Geometrical—Permat's Law of ray propagation. General Theory of image formation. Cardinal points. Defects of images. Aplanatic points.

**Physical—**Theory of Fresnel and Fraunhofer diffraction. Concave and echelon gratings. Resolving and dispersive powers. Diffraction of X-rays by crystals and X-ray spectrographs. Michelson, Fabry Perot and other interferometers. Lummer-Ghercke plate. Stellar interferometer. Theory of double refraction. Interference of polarised light, Rayleigh and Raman Scattering. Propagation of wavegroups and nature of white light. Electromagnetic Theory of Light.

Optical Instruments and their performance.

Objectives and oculars, Photographic lenses. Prism and Grating spectrographs for the visible, infra-red and ultra violet. Photometers. Microphotometers and Spectrophotometers.

*Paper III.—Magnetism and Electricity.*

**Magnetism :** Potential and field due to a small magnet, a magnetic shell and a uniformly magnetised sphere. Magnetic measurements. Kew Magnetometer. Production and measurement of strong and weak magnetic fields. Hysteresis. Elementary theories of magnetism.

**Electrostatics :** Gauss's Theorem and its applications. Condensers. Measurement of dielectric constant. Energy of electrostatic field. Boundary condition. Electrometers.

**Current Electricity :** Various types of galvanometers. Measurement of current, potential and resistance. Absolute measurement of the units. Electrostatic and electromagnetic Units and their ratios. Electro-magnetic induction. Measurement of inductance and capacity.

**Alternating Currents—**Single and three-phase Dynamos, alternators, motors and transformers. Rectifiers. A. C. measuring instrument.

Electromagnetic waves : Theory of Electromagnetic fields. Maxwell's equations. Propagation of waves. Theory of their reflection, refraction, dispersion and absorption. Production of waves and measurement of frequency. Elements of wireless telegraphy, telephony and television.

*Paper IV.—Electron and Nuclear Physics.*

Electrical discharge through gases.

Ionisation and ionisation currents. Ionisation and resonance potentials.

Cathode-rays : Charge mass and  $e/m$  of electrons. Photo electrons and Thermions. Electron optics and electron microscope. Radiation from accelerated electrons. Production and properties of X-rays. Theory of magnetism.

Positive Rays : Mass spectrographs and Isotopes. The periodic table.

Radio activity :  $\alpha$ ,  $\beta$  and  $\gamma$  rays. Radioactive transformations. Wilson chamber and Geiger counters. Production of high energy charged particles. Cyclotrom. Artificial disintegration, Induced radioactivity. Nuclear reactions. Structure of the Nucleus.

Cosmic rays, positron and meson.

*Paper V.—Modern Physics.*

1. Vector algebra and simple application of calculus to vector quantities.

2. Theory of Relativity—Optical and Electrical Experiments on the relative motion of ether and matter. Fresnel's convection co-efficient. Michelson and Morley's Experiments. Postulates of the special theory of relativity. Lorentz. Einstein. Transformations. Fitzgerald contraction and time dilatation. Addition of velocities. Variation of mass and inertia of energy. Very elementary ideas of the general theory of relativity. Experimental verifications.

3. General outlines of the theory of Atomic Structure and Spectral Lines :—

Bohr's theory of Hydrogen spectrum. Calculation of the energy of stationary states. Method of excitation of the Atom. Emission and absorption spectra. Fine Structure. Spectra of Alkalies and Alkaline earths and Multiplicity of spectral lines. Spectra of ionised atoms. Normal and

Note.—Detailed study of the above is included in paper VI (b) Spectroscopy and not in this paper.

Paper VI.—One of the following special subjects ;—  
(a) *Meteorology*.

buys Ballot's Law; cyclonic and anti cyclonic motions, influence of change of temperature gradient with height on change of wind weight

Turbulence—Taylor's eddy conductivity and eddy viscosity. Wind in the lower layers of the atmosphere.

Thermodynamics of moist air, Neuhoff's diagram and T-fidiagram. Radiation—solar and terrestrial.

General ideas about waves and disturbance in superposed layers of air with horizontal and inclined surfaces of separation.

Meteorological Optics ; Blue of the sky. Twilight colours.  
Halos Coronas. Rainbows.

General circulation of the atmosphere ; trades and antitrades : monsoons ; cyclones of the subtropical and tropical seas.

(b) *Spectroscopy.*

Different methods of excitation for atomic and molecular spectra.

Theory and use of different varieties of spectroscopes and spectrophotographs with prisms or gratings—plane, or concave. Dispersion and resolving powers. Astigmatism. Ghosts.

Theory and use of Michelson interferometer, Feby and Perot interferometer Lummer-Ghercke Plate, and Echelon. Their resolving powers. Absolute measurement of wavelengths.

The infra-red region, Apparatus and instruments. Infra-red interferometer. Focal isolation. Residual rays.

The ultra-violet region. Quartz and grating spectrographs. Schumann, Lyman and Millikan regions.

The X-ray region. Single and double crystal and grating spectrographs.

Photography of spectra. Sensitisation of plates for red-infra-red and Scheumann regions. X-ray plate.

Spectro-photometers. Recording and non-recording micro-photometer. Absolute measurement of intensity of spectral lines.

Spectrum analysis—qualitative and quantitative. Raising long and short lines. Standard electrodes and powders.

Methods of studying absorption spectra.

### *Theory of Atomic Spectra.*

Bohr-Sommerfeld theory of one-electron atoms. Circular and elliptic orbits. Nuclear motion. Relativity correction and fine structure. Electron spin. Bohr magneton. Spectra of ionised atoms.

Spectra of the elements of Groups I and II. Screening. Multiplet structure and  $LS$  coupling. Selection rules.

Spectral terms and their nomenclature. Primed terms and double excitation.

Spectral of Helium. Complex spectra.  $j, i$ -coupling.

X-ray spectra. K.L.M. series. Screening and relativity doublets. Absorption edges. Continuous spectra.

Zeeman effect-normal and complex Lande's factor, Paschen-Bach effect. Stark effect. Hyperfine structure. Methods of determining spin and magnetic moment of nuclei. Einstein's A and B co-efficients. Intensities of lines and of components of multiplet.

Correspondence principle. Rules of selection and polarisation deduced for various quantum numbers.

Vector model of the atom. Pauli's principle. Illustration of

*Theory of Molecular Spectra.*

Rotation, rotation—vibration and electronic spectra.

Selection rules. Isotope effect. Band systems. Rotational structure of electronic bands. Heat of dissociation of diatomic molecules, intensity relation in band spectra.

Raman spectra. Experimental technique for liquids, gases and solids, and for different temperatures. Measurement of depolarisation. Relation to molecular spectra. Vibrational and rotational Raman lines. Selection rules. Electronic transitions. Polarisability theory of diatomic molecules. Theory of polyatomic molecules. Raman effect due to lattice oscillations. Relation to molecular symmetry and strength of chemical bonds.

*(c) X-Rays.*

Phenomena in vacuum tubes; generation of X-rays high voltage generator; X-ray bulbs; different methods of setting up an X-ray establishment.

Study of properties of X-ray, secondary X rays, characteristic X-ray; absorption coefficient of characteristic X rays, ionisation by X rays, scattering of X-rays.

Laue's discovery of the diffraction of X-rays by crystals; Bragg's method of reflection; crystal analysis by Bragg's method of reflection; crystal analysis by the Debye-Scherrer method and the Laue method; X-ray spectrometers; Moseley's work on the measurement of wave-lengths of characteristic X-rays, Siegbahn's work; X-ray absorption spectra.

*(d) Wireless Telegraphy and Telephony.*

Series and parallel resonances, Sharpness or resonance. Simple theory of transmission of waves on lines. Theory of simple electric filters. Simple coupled circuits and impedance transformation.

Properties of coils and condensers: Resistance of coils at radio frequencies. Skin effect, Properties of iron core coils. Their A. C. inductance when D. C. is superimposed. Incremental permeability. Electrolytic and other types of condensers.

Physics of the thermionic tubes: Various types of tubes, their contents and uses. Audio-frequency amplifiers; Resistance coupled, transformer coupled and impedance coupled amplifiers. Class A and B and push-pull amplifiers.

Direct coupled and feed back amplifiers. Input impedance of triode, Power amplifiers—classes A, B and C.

Radio-frequency oscillators and amplifiers : untuned and tuned amplifiers for reception. Neutralization circuits and their adjustments. Crystal oscillators and other frequency stabilisation devices ; Ultra high frequency oscillators : the magnetron and the Barkhausen-Kurtz types.

Modulation : Methods of modulation ; amplitude and frequency modulations.

Vacuum Tube Detectors : Plate, grid power, heterodyne regenerative and super-regenerative detectors, Vacuum tube voltmeters. Modern superhet receivers and their performance, Automatic volume control. Tone control.

Antenna : Theory of radiation from an antenna, Distribution of field around a vertical antenna. Directional antenna, loop antenna and radio direction finders. Antenna arrays. Theory of ionosphere, skip distance, echoes, fading.

Power supplies : Metal rectifiers and vacuum tube rectifiers. Filter systems.

Microphones and Loud Speakers and their simple theory. Elementary ideas about Television.

### (Practical)

#### Previous :

1. Young's Modulus of a bar by the method of interference fringes.
2. Surface Tension by method of ripples.
3. Variation of Surface Tension with temperature.
4. Viscosity of liquids and air by rotating cylinder method.
5. Stroboscopic determination of frequency.
6. Adjustment and calibration of Spectrometer.
7. Constant deviation spectrometer.
8. Biprism.
9. Michelson's Interferometer.
10. Fabry Perot Interferometer.
11. Refractive index of a gas.
12. Elliptically and circularly polarised light.
13. Verification of Fresnel's formulae of reflection and refraction.
14. Standardisation of ballistic galvanometer.
15. Self and Mutual induction—(1) Ballistic Galvanometer method, (2) A. C. method.

16. Capacity of condensers.
  - (i) De Sauty's method.
  - (ii) Absolute method.
  - (iii) A. C. Method.
17. Hysteresis.
18. Potentiometer.
  - (i) Calibration of ammeter.
  - (ii) Calibration of Voltmeter.
  - (iii) Measurement of low resistance.
19. Carey Foster's Bridge.
20. Kelvin Bridge.
21. Transformer.
22. Magnetic Susceptibility of liquids.
23. Wireless receiving circuit.

*Final :*

1. Electrometer and Ionisation current.
2. Cathode ray Oscillograph.
3.  $e/m$  by a diode.
4.  $e/m$  by Busch method.
5. Charge of an electron.
6. Planck's constant by Photo-cell.
7. Use of Geiger-müller counter.
8. X-ray tracks by Wilson Chamber.
9. Laue pattern of a crystal.
10. Joly's Steam calorimeter.
11. Conductivity of bad conductors.
12. Platinum Thermometer.
13. Thermo-electric Thermometer.
14. Mechanical Equivalent heat.
15. Stefan's Constant.

And experiments of *one* of the following groups corresponding to the special subject chosen by the candidate :—

VI. (a) *Meteorology.*

1. Different types of clouds. General physical processes involved in their formation. Nephoscopes and their use for measuring wind direction and velocity.
2. Practical knowledge of self-recording instruments of a first class meteorological observatory.

3. Pilot balloons, following and working out single theodolite, double theodolite and flag methods.
4. Sounding balloons, meteorographs, Calibration, working out of records and interpretation.

(b) *Spectroscopy.*

1. Arc and Spark spectra.
2. Quartz spectrograph.
3. Concave Grating
4. Determination of Wave-lengths—Hartmann Formula.
5. Lummer Gehrcke Plate,
6. Zeeman effect
7. Spectrophotometer.
8. X-ray Spectrograph.

(c) *X rays.*

1. Practice with X-ray tubes.
2. Bragg's reflection method of X-ray analysis—  
(The wave-length, crystal constants and determining the structure of crystals).
3. Practice with the X-ray Spectrometer : wave-length of characteristic lines.
4. Absorption and scattering of X-rays.
5. Ionisation by X-rays.

(d) *Wireless Telegraphy and Telephony.*

1. High frequency measurement of capacity ; self and mutual inductance ; resistance.
  2. Measurement of wave-length
  3. Characteristic curves of triode valves.
  4. Practice with different detectors
  5. Crystal detectors and valve detectors.
  6. Practice with transmitting sets,
  7. Practice with amplifying sets.
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## CHEMISTRY PREVIOUS

(For the Examination of 1948).

Note—Candidates will be required to pass in the written as well as in the practical examination separately.

There will be *three* papers as follows :—

Paper I—Inorganic.

Paper II—Organic.

Paper III—Physical.

In each paper questions will be set on History.

*Inorganic* :—The following syllabus is meant to indicate the general scope of the examination.

A fuller study of the B. Sc. syllabus together with a systematic knowledge of the undermentioned less common elements and their compounds. Outlines of the main metallurgical processes treated non-technically, in the case of the elements italicised :—

Ne, Kr, Xe, Nt., Rb, Cs., Be, Tl., *Ce.*, Ti., *Th.*, V., Se, Te, Mo, *W*, U., Pd.

A general study of :—The atomic structure, radio activity, electronic theory of valency, allotropy, isomorphism, catalysis in industry, alloys and intermetallic compounds, hydrides, nitrides, carbonyls, per-acids and their salts, nitrogen fixation, fertilizers, fuels and furnaces, use of electricity in chemistry, passivity and corrosion of metals, use of organic reagents in analysis, important mineral resources of India and their utilisation. History of chemistry from the time of Boyle up to the end of the 19th century.

### Practical

1. Quantitative Analysis :—

(a) Standard gravimetric and volumetric methods of determining the following bases and acids, from pure substances and from their mixtures, not involving the separation of more than two constituents :—

Cu, Ag, Ca, Ba, Mg, Zn, Al, Pb, Fe, Ni,  $\text{NH}_4$ , arsenite, sulphite, sulphate, thiosulphate, chloride, bromide, iodide, carbonate.

(b) Determination of available chlorine in bleaching powder, and available oxygen in pyrolusite, hydrogen peroxide.

(c) Alloys : Silver coin, nickel coin, brass.

(d) Minerals : Dolomite, magnesite, galena.

Note.—Candidates will be expected to have analysed at least three mixtures under (a) and at least one each under (b), (c) and (d).

2. Qualitative Analysis: of mixtures of moderate complexity, containing not more than seven radicals from the list of radicals prescribed for the B. Sc. Examination with the addition of the following :—  
Arsenate, chromate, dichromate, permanganate, cyanide, thiosulphate.

Note.—Candidates will be expected to have analysed at least six mixtures.

3. Simple Preparations such as :—

$\text{FeSO}_4 (\text{NH}_4)_2 \text{SO}_4 \cdot 6\text{H}_2\text{O}$ , chrome alum, chrome yellow, pure  $\text{NaCl}$  from common salt,  $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$  from Kipp waste,  $\text{AgNO}_3$  from silver residues,  $\text{Cu}_2 \text{Cl}_2$ ,  $\text{PbO}_2$ , alum from bauxite.

Note.—Candidates will be expected to have prepared at least three substances.

**Organic :—**The B. Sc. course extended so as to include the simpler synthetic dyes, non-benzenoid rings, natural bases terpenes, sugars, organo-metallic compounds, other compounds containing sulphur, enzymes and examples of their industrial uses, the chemistry of carbon assimilation, (the whole treated in an elementary and representative manner). The theories of geometrical isomerism, optical activity, steric hindrance.

### Practical

Preparation of a simple compound.

Identification of two simple compounds in a mixture, and preparation of their derivatives.

Estimation of  $\text{COOH}$  group by titration or by silver salt method.

**Physical :—**

1. Kinetic Theory of matter. Deviations in the behaviour of gases. Van der Waals' equation and critical constants. Liquefaction of gases. Theory of corresponding states, Avogadro's number.

2. Relation of physical properties, such as refractivity, parachor, optical activity, viscosity, absorption spectrum to chemical constitution.

3. Phase Rule and its applications to (i) systems of two components, (ii) alloys, (iii) hydrated salts and (iv) binary liquid mixtures. Fractional distillation and steam distillation. Allotropy.
4. Law of mass action and its applications to equilibria in homogeneous and heterogeneous reactions. Effects of temperature and pressure on chemical equilibrium. Distribution Law.
5. Kinetics of chemical reaction. Energy of activation. Catalysis. Absorption.
6. Electrical Conductivity of aqueous and non aqueous solutions. Transport Number. Theory of Electrolytic dissociation. Ostwald's dilution law. Isohydric solutions. Hydrolysis. Buffer solutions. Ionisation constant for water. Solubility product. Strengths of acids and bases. Theory of indicators.
7. Preparation and physical properties of colloids. Ultra-microscope and Brownian movement. Coagulation and protection of colloids. Stability, Electric charge on colloidal particles. Application of colloids.
8. Laws of thermodynamics. Principle of maximum work. Gibbs-Helmholtz equation. Clapeyron-Clausius equation. Thermo-dynamics and thermo-chemistry. Thermo-dynamical derivations of the law of mass action, van't Hoff's isotherm and isochore and relation between osmotic pressure, lowering of the vapour pressure, depression of the freezing-point and elevation of the boiling-point.
9. Electrode potential, E. M. F. of concentration cell, with and without transport, and its application. pfl. Electrometric titrations. Decomposition potential.
10. Chemical affinity and its measurement.
11. Positive-ray analysis. Mass spectra. Isotopes.
12. X-ray Spectra. Atomic number. Elements of crystallography. Structure of simple crystals.
13. Radioactivity—natural and artificial. Disintegration Theory. Radioactive series of elements.
14. Emission spectra. Rutherford, Bohr, and Sommerfeld model of the structure of atom. Electronic theory of valency.
15. Photochemical reactions. Laws of photo chemistry (photo-chemical equivalence, Photo-sensitisation).

**Practical.**

Physico-chemical experiments on the following subjects:—

1. Molecular weight by the vapour density method.
2. Molecular weight by the freezing point method and by the boiling point method.
3. Solubility of solids in liquids and of liquids in liquids.
4. Viscosity of liquids, solutions and mixtures of liquids.
5. Surface tension of liquids, and solutions.
6. Velocity of reactions.
7. Partition co-efficient.
8. Heats of combustion and neutralisation.
9. Transition temperature.
10. Absorption.
11. Polarimetry.
12. Refractive indices of liquids, solutions and mixtures of liquids.
13. Electrical conductivity of solutions.
14. Determination of pH.
15. Electrometric titrations.
16. Preparation and purification of colloids, nature of electric charge and coagulation power of electrolytes.

**FINAL**

*(For the examination of 1949)*

Note.—Candidates will be required to pass in the written as well as in the practical examination separately.

Students who have passed the Previous may offer any one of the following branches of chemistry:—

[1] Inorganic, [2] Organic, [3] Physical or [4] Applied.

Notice must be sent to the Registrar by the 15th August, of the branch which the student intends to offer at the ensuing examination and in the case of [4], the industry or manufacture to which he is attached.

A student offering Inorganic, Organic, or Physical shall present a thesis dealing with original work done by him in his selected branch. The thesis, type written and in ink, must reach the Registrar not later than one week before the date fixed for the written examination.

In each of these three branches, there will be *two* papers in addition to the thesis.

In branch (4) Applied Chemistry, the procedure for testing the fitness of a candidate, will be decided as occasion arises.

Candidates will be expected to have a general acquaintance and knowledge of the trend of modern research of the main landmarks in the historical development of Chemistry and of the contributions of workers of outstanding importance towards this development. The following syllabus indicates the scope of the examination :—

### *Inorganic.*

#### Paper I : Elements and their Compounds.

A systematic study of occurrence, important methods of extraction, properties and chief uses of the chemical elements and their compounds from the standpoint of the periodic classification.

Manufacturing methods including an understanding of the physico-chemical principles involved in the manufacture of:—

He, H, O, Cl, Fe, Cu, Ag, Au, Pb, Al, Ni, Cr, Pt.

A general study of the topics given below, in addition to the topics mentioned in the syllabus for the Previous M. Sc. Examination :—

Trans-uranic elements, silicates, ferrous and non-ferrous alloys, the rare earths, complex compounds, heteropoly acids, technical applications of high and low temperatures, reactions in solvents other than water, compounds of inert gases, recent work in new elements.

#### Paper II : Methods and Theories.

The scope of the subject matter for this paper will be indicated by the following list of topics :—

Atomic structure, transmutation of elements—natural and artificial, radioactivity—natural and induced, isotopes and their separation, application of the electronic theory of valency to acids-bases and oxidation-reduction, structure of molecules and the methods used to study it, a general idea of crystals and their structure, magnetic susceptibility and Raman spectra in relation to structure of molecules, abnormal and anomalous valency, spatial configuration of compounds of elements other than carbon, determination of atomic weights, microchemical methods in outlines, historical survey of the

conception of acids and bases, acquaintance with recent analytical methods and methods of preparing new compounds.

### Practical

#### 1. Quantitative Analysis.

- Determination of three basic and/or acidic constituents from a mixture.
- Determination of three constituents from alloys.
- Determination of two constituents from an ore, besides silica.

Acquaintance with standard gravimetric and volumetric method including the use of iodate, bromate, titanium trichloride, ceric sulphate, semi-nitro methods, is expected.

#### 2. Qualitative Analysis.

- Analysis of mixtures of moderate complexity, containing common bases and acids, including insolubles, not exceeding eight radicals.

- Analysis of alloys, ores and minerals.

- Analysis of mixtures containing upto four elements from the following t—

Li, Be, Ce, Ti, Zr, Th, V, Se, Mo, W, U.

#### 3. Preparations.

Substances should be selected with a view to the processes and the fitting up and manipulation of the apparatus necessary in their preparation. The following list gives an idea of the types of preparations which may be expected:—

Sodium cobaltinitrite, sodium thiosulphate, potassium permanganate, potassium dichromate, potassium iodate, anhydrous chlorides of Mg, Zn, Al, and Pb, Werners complexes, hydrazine sulphate, hydroxylamine hydrochloride, Iodine from iodine residues, barium nitrate from barites, lead tetra-acetate from galena, cerium and thorium compounds from monazite sand, and other preparations of a similar nature.

- Acquaintance with methods of water analysis, simple gas analysis, and use of Lunge's nitrometer and spectroscope.

### Organic.

The following topics in addition to those mentioned for the previous examination will roughly cover the syllabus for the Final Examination in Organic Chemistry:—

Electronic theory of valency and mechanism of organic reactions, modern organic reagents and their application, new

methods of analysis, structure of organic molecules in relation to the physical properties such as parachor, dipole moments absorption spectra, and resonance energy, colour and chemical constitution modern theories about optical and geometrical isomerism, tautomerism, the theory of strainless ring structures, organo-metallic compounds, free radicals, carbohydrates, terpenes and related compounds, natural amino-acids, proteins, alkaloids, chemistry of porphyrins, chlorophyll, anthocyanins and flavones, unsaturation and conjugation, synthetic polymers, carotenoids, vitamins, the steroids, synthetic drugs, perfumes, explosives, fibres.

Candidates are expected to have some acquaintance with original papers.

### *Physical.*

Elementary organic analysis, estimation of halogens, S, N, C and H, estimation of the following groups:—OH, NO<sub>2</sub>, NH<sub>2</sub>, COOH, estimation of simple substances in solution such as glucose and formaldehyde, determination of refractive index, optical rotation, saponification and iodine values of oils.

Identification of an organic compound of a complex nature, identification of two compounds-components in a mixture and preparation of their derivatives, estimation of a simple organic compound in a mixture.

Preparation of an organic compound involving two or three stages, in a pure state.

### *Physical.*

Knowledge of more advanced nature of the following subjects:—

1. Physical properties of elements and compounds, phase rule applied to complex systems. Structure of crystals. Electron diffractions. Radioactivity. Positron, Deuteron and Neutron, Electronic theory of valency. Structure of atom.
2. Detailed study of (i) Kinetics of chemical changes; (ii) Chemistry of surfaces; and (iii) magnetism in relation to chemistry.
3. Thermodynamics: Joule-Thomson effect, treated thermodynamically. Derivations of phase rule and Gibbs adsorption isotherm. Donnan's theory of membrane equilibrium. Nernst's heat theorem

- and its applications. Entropy and its application to chemical problems.
4. Solutions: Activity theory of solution. Determination of activities. Modern theories of strong electrolytes. Ionisation in nonaqueous solvents. Fused electrolytes.
  5. Electrochemistry: Oxidation reduction potential. Overvoltage
  6. Colloids: Kinetics of rapid and slow coagulation. Sol-gel transformation. Emulsions. Gels. Colloidal electrolytes
  7. Photochemistry: Actinometry Photo chemical yield and quantum efficiency. influence of wave length, light intensity, temperature and other factors on quantum yield. Photochemical kinetics. Predissociation spectra. Mechanism of Photo chemical reactions. Photo-inhibition. Photo-chemical after effects, Theories of photosensitisation. Latent images. Fluorescence. Phosphorescence. Chemiluminescence.
  8. Structure of molecules. Dipole moment. Absorption, Raman and band spectra.
  9. Application of physico-chemical principles to industrial operations, such as, in the manufacture of fine and heavy chemicals, soaps, cellulose, rubber and in dyeing, printing, tanning, photography, electroplating,

#### Practical,

1. Determination of the complex-ion formation<sup>a</sup> by the following methods:—
  - (i) Cryoscopic,
  - (ii) Partition co-efficient,
  - (iii) Electrical conductivity, and
  - (iv) E. M. F.
2. Hydrolysis of salts like aniline hydrochloride by the following methods:—
  - (i) Partition efficient,
  - (ii) Electrical conductivity,
  - (iii) E. M. F.
3. Solubility of sparingly soluble salts by the following methods:—
  - (i) Electrical conductivity and
  - (ii) E. M. F.



4. Determination of pH. by the following methods—
  - (i) E. M. F.
  - (ii) Electrical conductivity,
  - (iii) Ester hydrolysis, and
  - (iv) calorimetric measurement.
5. Comparison of the strengths of acids and bases by the following methods:—
  - (i) Electrical conductivity, and
  - (ii) thermochemical measurements.
6. Electrometric titrations.
7. Determination of the dissociation constants of polybasic acids.
8. Determination of transport number of ions.
9. Determination of vapour pressure of pure liquids and solutions.
10. Study of absorption spectra of solutions.
11. Identification of elements from their emission spectra.
12. Velocity of reactions
13. Determination of the charge on colloidal particles.
14. Determination of Parachor.
15. Determination of dipole moment.
16. Verification of the law of photochemical equivalence.

#### Applied.

The principle has been laid down that a candidate will be expected to show that he has *bona fide* devoted himself to some important industry or manufacture and has acquired a reasonable degree of efficiency under all *three* of the following heads:—

- (i) *Technical* —He should have either (a) performed systematic analytical control, (b) engaged in systematic research (c) introduced improved methods of mechanical handling, application or distribution of power, etc.
- (ii) *Economic*.—He should have acquired some knowledge of sources and markets, of costing (including plant, power, labour control, distribution, etc) and of disposal or utilization of by-products and waste.
- (iii) *Foreign*.—He should have studied the methods in use in other countries, as far as ascertainable by him.

**ZOOLOGY****PREVIOUS***(For the Examination of 1948).*

A.—The structure, development, Bionomics and Distribution in space and time of typical representatives and of other examples illustrative of general characters of the principal sub-divisions of each phylum of the Non-Chordata.

B.—The general principles of Biology, comprising the various theories of Evolution and the subjects of Variation, Heredity, Sex, Adaptation etc.

The standard of examination is approximately indicated by the following text-books :—

Parker and Haswell: Text book of Zoology, latest edition, two volumes.

Sedgwick: Text book of zoology.

The student is expected to consult other books of reference as well.

There will be *three* papers :—

Paper I will deal with the Comparative Anatomy and Embryology of Protozoa, Porifera, Coelenterata, Platyhelminthes, Nemathelminthes, Trochelminthes, Molluscoida and Echinodermata.

Paper II will deal with the Comparative Anatomy and Embryology of Annulata, Arthropoda and Mollusca.

Paper III will deal with the general principles of Biology, including the facts and theories of Evolution and the subjects of Variation, Heredity, Adaptation, Selection, Isolation, Sex and Biometrics.

Candidates must produce at the practical examination their preparations and note-books containing a complete record of laboratory work.

**FINAL***(For the Examination of 1949).*

The subjects for the examination shall be—

A.—The structure, Development, Bionomics and Distribution in space and time of typical representatives and of other examples, illustrative of general characters of the principal sub-divisions of the Chordata.

A detailed knowledge of one of the three groups to be announced at least one year previous to the date of examination. The groups selected until further notice are—

- \*(a) Fishes (including Fisheries)
- (b) Reptiles, and
- (c) Entomology.

C.—A thesis recording original work done by the candidate together with a review of recent literature on the problem investigated by him.

A candidate will be required to offer Papers I and II and either (a) or (b) or (c) or (d) of Paper III.

Paper I will deal with the comparative Anatomy, Embryology, Geographical and Geological Distribution of the primitive Chordata. Cyclostomata. Pisces and Amphibia.

#### \*Special Group—Fishes

1. Structure and development.
2. Biology of Fishes.
3. Classification and Systematic Survey with special reference to Indian Fishes, including Marine, Brackish-water, Fresh water and Hillstream Fishes.
4. Origin and evolution of Fishes.
5. Applied ichthyology.
- Method of Fishing and Fisheries, including Fresh water and estuarine fisheries, in shore or coastal Fisheries.
- Problem of Fishing Industries, Fluctuations, cyclic intensities, Migrations, Influence of Plankton.
- Tinning and canning, Rail road transport and marketing. Economic survey of fisheries
- By-products of Fishing Industry. Fish oil, Fish manure, Isinglas, etc.
6. Maintenance and working of Aquaria, Hatcheries, Rearing and stocking ponds.

Larvivorous Fishes and their utility.

In addition to books already suggested for the M. Sc. Examination the following may be consulted :—

NORMAN : History of Fishes.

ROULE : Journeys and Migrations of Fishes.

California Fisheries Bulletin.

Administration Reports of the Madras Fisheries Department. Administration Report of the Punjab Fisheries Department. Empire Marketing Publications on Fisheries of the British Empire.

Recordings and Memoirs of the Indian Museum.

Paper II will deal with the Comparative Anatomy, Embryology, Geographical and Geological Distribution of the Reptilia, Aves and Mammalia.

Paper III (a) will deal with Fishes, with special reference to the fresh water fishes of the U. P.

Paper III (b) will deal with Reptiles.

\*Paper III (c) Entomology.

Paper III (d) Thesis.

#### \*I. Outline of—

1. Insect Morphology (external and internal in a comparative manner).
2. Insect Development, Embryonic, Post-Embryonic and Post-Metabolic.
3. Ecology, with special reference to climate, parasitism, relation to plants, animals and men, population of insects etc.
4. Palaeontology and Ancestry of the major orders of insects.
5. History of Entomology, with special reference to insect lore in ancient India.

#### II.—Taxonomy.—

1. General principles of insect Classification, International Rules of Nomenclature, Faunistics, etc.
2. The students are expected to be able to recognise all the thirty-two orders of insects occurring in India and have a specially detailed knowledge of the characters, distribution, Geological History, Bionomics and Economic importance of:—

- |                      |                      |
|----------------------|----------------------|
| (i) Thysanura,       | (ii) Collembola,     |
| (iii) Odonata,       | (iv) Orthopteroidea, |
| (v) Thysanoptera,    | (vi) Hemipteroidea,  |
| (vii) Hymenoptera,   | (viii) Coleoptera,   |
| (ix) Lepidoptera and | (x) Diptera.         |

#### III.—Practical work.—

1. Study of types for detailed Morphology—  
(a) *Poeciloceris pictus*.    (b) *Polistes hebreus*.
2. Collection and identification of insects common at Agra.

#### Books recommended :

1. Essig, E. O. : College Entomology.
2. Imms, A. D. : Text-book of Entomology.
3. Imms, A. D. : Recent Advances in Entomology.
4. Packard, A. S. : Text-book of Entomology.
5. Snodgrass, R. E. : Principles of insect Morphology.
6. Weber, H. : Grundriss der Insektenkunde.
7. Brandley, J.C. : Laboratory guide to wing venation of insects.
8. Indian Journal of Entomology.

### Practical

A selected subject shall be studied as much as possible from the practical standpoint. A selected group shall be studied primarily from the local fauna available in the United Provinces and also from other examples of important types.

Candidates must produce at the practical examination their preparations and note-books, containing a complete record of laboratory work which will be taken into consideration in determining the results of the examination.

### BOTANY

(For the Previous and Final Examinations of 1949).

Note.—Candidates will be required to pass in the written as well as the practical examination separately.

For the M. Sc. Examination in Botany, Previous and Final, there shall be the following *five* papers and thesis or Special-paper as indicated below:—

Paper I. Thallophytes.

Paper II. Bryophytes and Pteridophytes.

Paper III. Gymnosperms, Cytology and General Biology.

Paper IV. Angiosperms.

Paper V. Physiology and Ecology.

Thesis or Special paper on *Study of Fungus pests of Crops in the United Provinces.*

Out of the five papers, candidates may take any *three* for the Previous examination, and the remaining *two* papers and the thesis or Special paper for the Final examination.

Two of the three papers set for the M. Sc. Examination shall be common for the Previous and Final examinations every year.

1. The systematic morphology, physiology and life histories of the typical representatives of the principal groups of Thallophyta, Bryophyta, Pteridophyta, Gymnosperms and the Angiosperms.
2. A knowledge of the more important fossil types.
3. Physiological Plant Anatomy and Ecology.
4. A knowledge of "Soil Bacteria" and "Soil Fungi."

Candidates will also be expected to study the phenomena of nutrition of Lichen Algae. Lichen Fungi, and reproduction of Lichens.

5. Plant Physiology.

6. Study of Cytology including the following :—  
Protoplasm, Plastids, Somatic Mitosis, Metosis, Fertilisation, Determination of Sex, Linkage. Cytological basis of Mendelism.

7. Fundamental facts of variation and heredity and the theories of evolution.

8. Principles of Plant-breeding.

9. Special paper on *Study of Fungus Pests of Crops in the United Provinces.*

Or

Thesis recording original work done by the candidate and a brief review of recent literature on the problem investigated by him. Two typed copies of the thesis should be submitted a week before the examination.

Practical.

The Examination shall comprise the following :—

1. Detailed study of representative types of the different groups prescribed in the syllabus.

2. Study of Physiological plant anatomy.

3. Cytological study of suitable specimens.

4. Demonstration of important phenomena of plant life.

5. Referring of plants to their families or sub-families.

6. Detailed study of diseased crop plants and the technique connected with work of the life histories of the parasites infecting them or a study of the large aspects of the subject taken up by the student for his thesis.

7. *Viva voce* examination on subjects for the practical examination.

The following books are recommended :—

Smith : Cryptogamic Botany, Vols. I. and II.

Eames : Morphology of Vascular Plants,

*Thallophytes.*

West and Fritsch : British Freshwater Algae.

West : Algae.

Smith : Algae.

Fritsch : The Structure and Reproduction of the Algae.

Harshberger : Mycology and Plant Pathology.

Gwynne - Vaughan : Fungi .

Gwynne-Vaughan and Barnes : Structure and Development of Fungi.

Heald : Manual of Plant Diseases,

Brooks , Plant Diseases

Fitzpatrick : The Lower Fungi

Butler : Fungi and Disease in Plants.

#### *Bryophytes.*

Cavers : Inter-relationships of Bryophyta.

Kashyap : West Himalayan Liverworts.

Campbell : Mosses and Ferns.

#### *Pteridophytes*

Bower : Origin of a Land Flora.

Bower : Ferns.

Beddome : Ferns of British India.

#### *Gymnosperms.*

Coulter and Chamberlain : Morphology of Gymnosperms.

Pearson : Gnetales.

Chamberlain : Living Cycads.

#### *Fossil Botany.*

Scott : Studies in Fossil Botany.

Scott : Extinct Plants and Problems of Evolution.

Seward : Plant Life through the Ages.

Seward : Fossil Plants.

#### *Angiosperms*

Coulter and Chamberlain : Morphology Angiosperms.

Eames and Macdaniells : Introduction to Plant Anatomy.

Jeffrey : Anatomy of Woody Plants.

Haberlandt : Physiological Plant Anatomy.

Solender : Systematic Anatomy of Dicotyledons.

Willis : Flowering Plants and Ferns,

Abber : Monocots.

Arber : Water Plants,

Rendle : The Classification of Flowering Plants.

Hutchinson : Families of Flowering Plants.

Skene : Biology of Flowering Plants.

Duthie : Flora of Upper Gangetic Plain.

*Physiology.*

Palladin : Plant Physiology.

Raber : Principles of Plant Physiology.

Barton Wright : Recent Advances in Plant Physiology.

Miller : Plant Physiology.

Stiles : Photosynthesis.

Stiles : Permeability.

Spoehr : Photosynthesis.

Dixon : Ascent of Sap.

Dixon : Transpiration Stream.

Bose : Ascent of Sap.

Bose : Physiology of Photosynthesis.

Darwin and Acton : Practical Plant Physiology.

Detmer and Moore : Practical Plant Physiology.

Wheldale : Anthocyanin Pigments in Plants

*Geology and Plant Distribution*

Champbell : An Outline of Plant Geography.

Schimper : Plant Geography.

Warming : Ecology of Plants

Tansley and Chipp : Aims and Methods in the Study of Vegetation.

Weaver and Clements : Plant Ecology.

*Cytology and Microtechnique.*

Sharp : Cytology.

Wilson : Cell in Development and Heredity.

Chamberlain : Methods in Plant Histology.

Lee : Vade Mecum.

Cowdry : General Cytology.

Darlington : Recent Advances in Cytology.

*General Biology*

Wheldale : Causes of Evolution.

Lock : Heredity, Variation and Evolution.

Bateson : Mendelism.

Coulter : Outline of Genetics.

Babcock and Clausen : Genetics in relation to Agriculture.

Coulter : Evolution of Sex in Plants.

such special references as the teacher may suggest.



## LL. B. EXAMINATION

(For the Previous Examination of 1948).

The following Text-books and Acts are recommended :—

Paper I.—Roman Law.

Hadley : Roman Law.

Maine : Ancient Law, Chapters 1, 2, 3, 6 and 9.

Paper II.—The Law of Contracts.

(i) Anson : Principles of the English Law of Contracts.

(ii) Pollock and Mulla : Indian Contract Act. (Act IX of 1872), Students' Edition.  
Sale of Goods Act (Act III of 1930).

(iii) Indian Partnership Act, 1932.

(iv) University Selection of Leading Cases.

Paper III.—The Law of Easements and Torts.

(i) Underhill : Torts.

Or

Ratan Lal : Law of Torts.

(ii) The Indian Easements Act (Act V of 1882).

(iii) Joti Prasad : Law of Easements.

(iv) University Selection of Leading Cases.

Paper IV.—The Law of Evidence.

(i) Ratan Lal : Evidence Act.

(ii) University Selection of Leading Cases.

Paper V.—Criminal Law and Procedure.

\*(i) Ratan Lal : Indian Penal Code, Students' Edition.

(ii) Code of Criminal Procedure, excluding the Schedule and Chapters 33, 34, 38, 43, 44 A and 46.

(iii) University Selection of Leading Cases.

Paper VI.—Constitutional Law.

(i) Dicey : On the Law of the Constitution (omitting the chapter on 'Droit Administratif' and the Appendices).

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\* Candidates will not be required to have a knowledge of the amount of punishment which can be inflicted for any offence.

- (ii) The Government of India Act, 1935 (omitting Parts II, III, IV, VI to XII of the Sixth Schedule).

Paper VII.—Jurisprudence.

Salmond: Jurisprudence (omitting Appendices.)

(For the Final Examination of 1949).

The following Text-books and Acts are recommended :

Paper I. —Civil Procedure and Limitation.

- (i) The Code of Civil Procedure (omitting orders 27, 28, 35, 36, 37, 45, 46, 48, 49 and 51 of Schedule I).
- (ii) Mulla : Commentary on the Civil Procedure Code (Students' Edition).
- (iii) Walsh and Weir : Pleadings in India.

Or

- Mogha : The Law of Pleadings in British India.
- (iv) The Indian Limitation Act (omitting the schedule).  
The Indian Limitation Act (by Durga Prasad) is recommended for study.
- (v) Arbitration Act X of 1940.

Paper II.—The Law relating to Land Tenures, Rent and Revenue (U. P.).

- (i) U. P. Tenancy Act No. XVII of 1939.
- (ii) Benode Behari Lal : Tenancy Law in the Provinces.
- (iii) Act No. III of 1901 (United Provinces).

Or

The Law relating to Land Tenures, Rent and Revenue (C. P.).

- (i) Central Provinces Tenancy Act of 1920.
- (ii) Central Provinces Land Revenue Act of 1911.
- (iii) University Selection of Leading Cases.

## Paper III.—Hindu Law.

(i) Mulla : Hindu Law.

(ii) University Selection of Leading Cases.

## Paper IV.—Mohammedan Law.

(i) Wilson : Digest of Anglo-Mohammedan Law from the beginning of Part II to the end of the book.

(ii) Mulla : Mohammedan Law.

(iii) Kashi Prasad : Muslim Law (Student's edition).

(iv) University Selection of Leading Cases.

## Paper V.—The Law relating to Transfer of Property, etc.

(i) The Transfer of Property Act (Act IV of 1882).

(ii) L. G. Mukerji : Law of Transfer of Property.

(iii) University Selection of Leading Cases.

## Paper VI.—Equity with special reference to Trusts and Specific Relief.

(i) The Indian Trusts Act (No. II of 1882).

(ii) The Specific Relief Act (No. I of 1877).

(iii) S. G. Baghchi : Snells Principles of Equity.

Chapters on the History and Maxims of Equity on Trusts, on Mistake, on Fraud—Actual and Constructive *i. e.* Chapters 1, 2, 3, 5, 6, 7, 8, 9, 22, 23 and 24.

(iv) H. P. Bagchi and Durga Prasad : The specific Relief Act.

(v) University Selection of Leading Cases.

## Paper VII.—Company Law and Income-Tax Law.

(i) The Indian Companies Act, of 1913 with amendments upto date.

(ii) The Indian Income-Tax Act of 1922 with amendments upto date.

Note.—Every Act mentioned in the above list should be understood to mean the Act with all subsequent amendments thereof.

University Selection of Leading Cases.

## I.—CONTRACTS:

Henthorn v. Fraser (1892), 2 Ch. 27.

Carlill v. Smoke Ball Co. 1893), I. Q. P., 256.)  
 Mohri Bibee v. Dharmodas Ghosh, 30, I. A., 114.

I. L. R., 30 Calcutta, 539.

Lalman v. Gauri Dutt, 11, A. L. J. R., 489.

Derry v. Peek, 14 A. C., 337 (Lord Herschell's judgment).

Jamal v. Moola Davood & Sons, 43, I. A., 6, I. L. R., 43, Calcutta, 493.

## II.—TORTS AND EASEMENTS

Lloyd v. Grace Smith & Co. (1912), A. C., 716 (Lord Macnaghten's judgment).

Butterfield v. Forrester, II East 60 ; 103 English Reports, 926.

Davies v. Mann, 10 M. and W., 546 ; 152 English Reports 586.

Rylands v. Fletcher, L. R. 1, Exch. 465.

British Columbia Ry. Co. v. Loach, A. I. R. 1916, P. C., 208.

Balbhadra Singh v. Badri Sah, A. I. R. 1926, P. C., 46.

Re. Polemis, III K. B., 560.

## III.—EVIDENCE.

Balkishan Das v. Legge, I. L. R., 22, Allahabad, 149.

Sarat Chandra Dey and others v. Gopal Chandra Laha and others, 29, Calcutta, 296.

Pakala v. Emperor, A. I. R., 1939, P. C., 47.

Lal Chand v. Mahant Ram Rup, A. I. R. 1926, P. C., 9.

## IV.—CRIMINAL LAW.

R. v. Govinda, I. L. R., 1 Bombay, 342.

Ganouri Lal v. Q. E., I. L. R., 16 Calcutta, 206.

Amrita Lal Hazara v. K. E., I. L. R., 42 Calcutta, 957.

Q. E. v. Moss A. W. N. 1894, p. 23.

Mohd. Hussain v. K. E., 15 Oudh Cases, 321.

Tapti Prasad v. K. E., 15, A. L. J. R., 590.

## V.—C. P. RENT AND REVENUE LAWS.

Dayal v. Enlabia Bai, 4 N. L. R., 120.

Man Das v. Gajadhar, 23 N. L. R., 9.

## VI.—HINDU LAW.

- Hanooman Parsad Panday v. Babbee Munraj Kunwaree.  
6 M. I. A., 393.  
Raja Brij Narain Rai v. Mangla Parsad Rai and others,  
51. I. A., 129 ; I. L. R. 46, All., 95.  
Musammat Girja Bai v. Sadasiv Dhundraj and others,  
43, Cal., 1031  
Isri Dutta v. Hansbutti, 10 I. A., 150 ; 10 Cal., 394.  
Krishna Murti Ayyar v. Krishana Murti Ayyer, A.I.R.  
1927, P. C., 139.  
Amrendra v. Sanatan, 60 J. A., 242.  
Anant v. Shankar, A. I. R. 43, P. C., 196.

## VII.—MOHAMMEDAN LAW,

- Gobind Dayal v. Inayat Ullah, I. L. R., 7, All., 775,  
Jafri Begam v. Amir Muhammad Khan, I. L. R., 7  
Allahabad, 822.  
Habibur Rahman v. Altaf Ali, I. L. R., 43 Calcutta,  
856 (P. C.)  
Muhammad Junaid v. Aulia Bibi, I. L. R., 42., All. 497.  
Fakhr-ud-din v. Kifayat-ul-lah (1910), 7 A.L.J.R., 1095.

## VIII.—TRANSFER OF PROPERTY.

- Beni Ram v. Kundan Lal, 21, All. 496, 26, I. A. 58.  
Gokul Das Gopal Das v. Purnamal Preamsukhdas, 10  
Cal., 1035 (P. C.)  
Ramcoomar Koondoo v. Jahan and Maria Mc. Queen,  
II Beng. L. R. 46 (P. C.)  
Webb v. Macpherson, I. L. R., 31 Cal., 57 (P. C.)  
Raja Kishandatt Ram v. Raja Mumtaz Ali Khan, 5 Cal.  
198 (P. C.)

## IX.—EQUITY.

- Burn & Co. v. McDonald, 35, Cal., 354.  
Mussoorie Bank Ltd. v. Albert Charles Raynoor, 4 All.  
500. Nagendrabala Dasi and another v. Dinanath Mahish  
and others, 51 Calcutta, 299.  
Books recommended for Leading Cases—  
Brij Nath Mithal : University Selection of Leading  
Cases for Law Final. (Gaya Prasad and Sons, Agra).  
Brij Nath Mithal : University Selection of Leading Cases  
for Law Previous. (Gaya Prasad and Sons, Agra).

## LL. M. EXAMINATION—1949.

### COMPULSORY SUBJECTS.

- I. Jurisprudence and Principles of of Legislation—
  - Holland : Jurisprudence.
  - Salmond : Jurisprudence.
  - Green : Theory of Political Obligations.
  - Gray : Nature and Sources of Law.
  - Maine : Ancient Law.
  - Maine : Early History of Institutions.
  - Bentham : Theory of Legislation.
  - Dicey : Law and Opinion of England.
  - Laski : Authority in the Modern State.
  - J. Brown : Austinian Theory.
  - J. Brown : Underlying Principles of Legislation.
  - Clark : Practical Jurisprudence.
  - Holmes : Common Law.
  - Garner : Introduction to Political Science.
  - Maxwell : Interpretation of Statutes.
  - Joad : Introduction to Modern Political Theory.
- II. Constitutional Law, British and Indian—
  - Anson : Law and Customs of the Constitution.
  - Medley : English Constitutional History.
  - Thomas : Leading Cases in Constitutional Law.
  - Marriot : Mechanism of the Modern State.
  - Archibald : Outlines of Indian Constitutional History.
  - Ridges : Constitution.
  - Mukerji : Indian Constitution.
  - Mukerji : Indian Constitutional Documents.
  - G. N. Singh : Constitutional Development of India.
  - Frederick White : India—A Federation ?
  - H. D. Hall : The British Commonwealth of Nations.
  - Sidney law : Governance of England.
  - Committee on Federation.
  - Davidson : Report of the Round Table Conference.
  - Roman Law—
    - yle : Institutes of Justinian.
    - ste : Institutes of Gains.

Muirhead : History of Roman Law.

Sohm : Institutes of Roman Law.

Buckland : Principles of Roman Private Law.

Roby : Introduction to the Digest.

IV. *Either (a) Hindu Law or (b) Mohammedan Law.*

(a) Hindu Law—

Setlur : Collection on Law of Inheritance.

Mayne : Hindu Law.

Sarkar : Mimansa Rules of Interpretation.

Golab Chandra Shastri : Hindu Law.

Banerji : Marriage and Stridhan.

Sarkar : Adoption.

Sarvadhikari : Inheritance.

Sen : Hindu Jurisprudence.

Dattaka Chandrika and Dattaka Mimansa, translated by Ghosh.

Mitakshara, Vyavahardhyaya, translated by Gharpure.

Ganapati Aiyer : Law of Endowment.

Yajnavalkya Smriti.

Dayabhaga.

(b) Mohammedan Law—

Wilson : Anglo-Mohammedan Law.

Amir Ali : Mohammedan Law.

Sircar, S. C. : Mohammedan Law.

Tyabji : Mohammedan Law.

Abdur Rahim : Principles of Mohammedan Law.

Jung : Administration of Justice in Muslim Law.

OPTIONAL SUBJECTS.

Only *two* out of the following may be taken :—

I. *Either (a) Hindu Law, or (b) Mohammedan Law,* whichever is not taken as compulsory subject.

(a) Hindu Law—as under compulsory subjects.

(b) Mohammedan Law—as under compulsory subjects.

II. Law of Contracts—

Pollock : Law of Contracts.

Street : Foundation of Legal Liability, Vol. II.

Smith : Leading Cases on Law of Contracts.

Bowstead : On Agency.

- Lindley Partnership.  
 Salmond : Law of Contract.  
 Mayne : Damages (relevant portions).  
 Banerji : Specific Reliefs.
- III. Transfer of Immovable Property and Easements.  
 Ghose : On Mortgages.  
 Williams : Real Property.  
 Tudor : Cases on Real Property.  
 Williams : On Vendors and Purchasers.  
 Mukerji : On Perpetuities.  
 Gale : On Easements.  
 Peacock : Law of Easements
- IV. Equity—  
 Story : Equity Jurisprudence.  
 Underhill : Trusts and Trustees.  
 Langdell : Equity Jurisprudence.  
 Banerji : Specific Relief.  
 White and Tudor : Leading Cases on Equity.  
 Kerr : Injunction.  
 Fry : Specific Performance.
- V. International Law, Public and Private—  
 (a) Public.  
 Hall : International Law.  
 Oppenheim : International Law.  
 Pitt Cabbett : Leading Cases on International Law.  
 (b) Private.  
 Dicey : Conflict of Law.  
 Westlake : Private International Law.
- VI. Wills and Administration—  
 Sen Gupta : Indian Succession Act.  
 Theobald : Treatise on Law of Wills.  
 Williams : Law of Executors and Administrators.  
 Underhill and Starahan : On Interpretation of Wills and Settlements.

Note.—The candidates are advised to consult the Tagore Law Lectures on the subjects pertaining to the prescribed course of study. Indian Acts pertaining to the subjects together with subsequent amendments up to six months preceding the date of examination, should also be studied with the help of standard commentaries.



## FIRST YEAR B. Com. COURSE

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The subjects of instruction and examination shall be as follows :—

### 1st Year.

- (1) English.
- (2) Elements of Economics.
- (3) Elements of Currency and Banking.
- (4) Book-keeping and Accountancy.
- (5) Business Methods.
- (6) Economic and Commercial Geography.

A departmental examination will be held at the end of the first year.

#### (1) English.

Questions will be set on the following :—

- (a) Draft of Commercial and Official Correspondence.
- (b) Explanation of terms and passages occurring in market reports.
- (c) Precis of a suitable passage.
- (d) Re-writing of incorrect or badly constructed sentences.
- (e) An essay on a subject of general interest.

#### (2) Elements of Economics.

**Production**—Analysis of the expenses of production factors which limit Supply.

**Exchange**—Prices ; Laws of Supply and Demand.

**Consumption**—The basis of demand, wants ; budgets and the division of Income.

**Distribution**—Rent, Interest, Wage and their difference.

The Supply of Capital and Credit ; Co-operative credit.

The Supply of labour and population.

**Organization and Management.**—The Principle of Substitution.

Large and small scale production..

Division of labour. Machinery.

**(3) Elements of Currency and Banking.**

- (a) **Currency.**—The origin of money, barter, grain payments. Money and its functions. Coins and the currency system. Legal tender. Standard and token money. Legal basis of money. Mint price of gold or silver, parity of exchange. Gresham's law. Paper Currency. Convertible and inconvertible credit instruments. Bills of exchange, cheques, hundies.
- (b) **Banking.**—The functions of a bank. Balance-sheets. The cheque system and the clearing house. Means of inland remittance. Growth of Banking in India. Mahajans, Chetties, Shroffs, Early joint-stock banking. The Presidency Banks. The Imperial Bank. The present joint-stock Banks—European and Indian Government control of banks. Information to be made public. Other means of protecting customers. Post Office Savings Banks. An elementary treatment of the present system of currency (including paper currency) in India.

**(4) Book-keeping and Accountancy.**

The Principles of Double Entry Book-keeping and their application. Books of Original Entry. The Ledger. Trial Balance. Trading and Profit and Loss Accounts, with apportionments. Balance-Sheet.

In the treatment of the above, the following matters will be included:—

Cheques, Bills of Exchange and Promissory Notes, Good-will; Classification of Assets; Bad Debts; Depreciation and Reserves (elementary); Consignments; Joint Venture and Contract; Accounts; Elementary Partnership and Company Accounts.

**(5) Business Methods.**

The general routine of a Business House; Inward and Outward Correspondence, including Drafting and Filing. Methods of Rapid Communication. Duplicating Processes.

The significance of Trade, Commerce and Industry. Manufacturing and Distributing Houses. The buying and selling of goods. Importation and Exportation with an elementary knowledge of fire and marine insurance as applicable thereto.

The meaning of the principal commercial terms occurring in connection with the above, and preparation of the chief documents involved, including the arithmetical calculations.

**(6) Economic and Commercial Geography.**

**Climate.**—Annual distribution of temperature and rainfall with causes ; how these factors divide the world into climatic regions.

Natural regions of the world in relation to climatic regions, their natural vegetation, animal life, occupations and products.

**Soil (outline only).**—Classes and properties, preservation of soil—irrigation, dry-farming.

**Commercial Products.**—Each according to its properties and utility, requirements of climate, soil etc. distribution and commercial importance (a) generally, (b) in India.

1. Vegetable products, including forest products.
2. Animal commodities.
3. Fisheries.
4. Mineral Wealth.

Sources of power. Studies of distribution maps. Growth of Towns. Means of Transport.

**B. COM. EXAMINATION—1949.**

**I. English—**

**Part I—**

This paper will consist of *two* parts. The first part will contain questions on prescribed prose text-books of the B. A. standard, including critical and explanatory questions dealing with the subject-matter.

Prescribed books—

- (1) Ruskin's *Crown of Wild Olive*—The following lectures only—

- (i) Lecture on Work.
- (ii) Lecture on Traffic.

- (2) (a) Essays by Sir Arthur Helps (Walter Scott Ltd., London). The following Essays only—

- (i) On Practical Wisdom (ii) Aids to Contentment, (iii) On Self-discipline. (iv) On our judgment of other men. (v) On the exercise of Benevolence. (vi) Domestic rule. (vii) Advice.

(viii) Secrecy. (ix) On the education of a man of business. (x) On the transaction of business. (xi) On the choice and management of Agents. (xii) On the treatment of Suitors- (xiii) Interviews. (xiv) Of Councils, commissions, etc. (xv) Party spirit.

(b) Dickinson and Sharma : Twentieth Century Addresses *omitting* the addresses on Criticism- Jargon and Aphorisms.

(3) *My Life and Works*, by Henry Ford (William Heinemann, Ltd.) [Introduction and Chapters I and II only].

Questions on Text shall be confined to the general subject-matter and purely literary questions shall not be put.

The second part will consist of questions on General English, comprising one or more unseen prose passages for summarising or explanation of the same standard as for B. A. or B. Sc. General English.

Paper II.—An essay on a subject of Economic or Commercial interest.

## II. Commerce—

Paper I.—Business Organisation.

- [1] Nature and constitution of business houses (sole traders, partnerships and joint stock companies).
- [2] Methods of financing business concerns.
- [3] Organisation of retail houses (including departmental stores, multiple shops and mail order concerns), wholesale houses and manufacturing businesses.
- [4] Formation and working of joint stock companies, including secretarial work.
- [5] Modern methods of publicity.
- [6] Insurance.
- [7] Stock and produce exchanges, including a study of stock and commodity market reports.
- [8] Rationalisation-Business combinations ; scientific managements ; methods of remunerating labour.
- 1) State in relation to industry.

Books recommended—

DAVAR : Business Organisation.

HANEY : Business Organisation.

THOMAS : Commerce.

SHIELDS : Industrial Organisation.

Paper II.—Commercial and Industrial Law.

[1] Indian Law relating to contracts (including sale of goods, bailments, indemnity and guarantee, agency and partnership), negotiable instruments, arbitration and insolvency. Indian labour legislation.

[2] Elements of Indian company law.

N. B.—Forty per cent. of the marks allotted to this paper shall be reserved for questions on Indian Company Law.

Books recommended—

DAVAR : Mercantile Law.

SEN and BANERJI : Mercantile Law.

Paper III.—Statistics.

1. Meaning and scope of statistics. Fundamental principles.
2. General methods of statistical investigation. Collection of statistical data. Determination of statistical units. Sources of data. Estimation. Classification of statistical observation.
3. TABULAR PRESENTATION.—Single tables—frequency tables—correlation tables—abstraction—mechanical tabulations.
4. DIAGRAMMATIC PRESENTATION.—Cartogram—Bar diagram—Polar diagram—Surface diagrams ; rectangular and circular. Volumes of three dimensional diagram—conventional forms.
5. GRAPHIC PRESENTATION.—Histograms—simple percentage cumulation. Histograms—absolute percentage—Trend.
6. AVERAGING.—Types of averages—simple, weighted, modal, median, moving average—statistical coefficient.
7. METHODS OF DISPERSION.—Meaning and purpose—absolute and relative dispersion—the Range—mean deviation—standard deviation—quartile deviation—'mean difference'—skewness.
8. Principles of index number.—making and using—the

## TEXT-BOOKS AND SYLLABUSES—1943 AND 1949

Base ; the choice of an average weighing method of aggregates — relatives of aggregates — average of relatives—chain averages.

9. INTERPOLATION.—Graphic ; and simple algebraic methods.
10. Correlation and ratio of variation.—Karl Pearson's Co-efficient of correlation. Application to groups—series, long-time and short time fluctuations. Methods of concurrent deviation—Lag Galton graph and regressions.
11. Application of statistical methods to Indian commercial problems : prices, wages, trade and transport. Certain sources of official statistics in India.

Books recommended—

KING : Statistical Method.

BODDINGTON : Statistics.

DUBEY and AGARWAL Elementary Statistics.

GHOSH and CHAUDHRI : Statistics.

(Published by the Indian Press, Ltd.)

### III.—Economics.

Paper 1.—Principles of Economics.

1. INTRODUCTORY.—Scope and subject matter of the science. Its divisions and their inter-dependence. Economics, a part of Sociology, Relation of Economics to other sciences.
2. METHODS.—Deductive and Inductive methods as applied in Economic Science.
3. DEFINITIONS.—e. g., Wealth, Labour, Value, Money Price, Capital, Land, etc.
4. CONSUMPTION—Wants. Definitions of total and marginal utility, Demand schedules and curves. Elasticity of demand. Consumer's surplus. Fashions and Customs with their effects on Demand.
5. PRODUCTION.—The factors or agents of production Land, labour, capital and organization. Combination of the factors in varying proportions. Relations of the Law of Diminishing Returns and investment.
6. LAND OR NATURAL RESOURCES.—Qualities, situation and fertility, climate, minerals, sources of power.
7. LABOUR.—Distinctive qualities, skilled and unskilled

- labour, division of labour; conditions of efficiency labour. Influence of social customs.
8. CAPITAL.—Conditions of accumulation of capital. Economic characteristics of machinery.
  9. ORGANIZATION OF PRODUCTION.—Large and small scale productions, advantages and limitations of each. Supply schedules and long period cost of production curves. Diminishing, Constant and Increasing returns. Principle of substitution. Inventions. Specialisation of the factors of production. Localisation of industries.
  10. CO-OPERATION.—Agricultural and Urban, the theory and organization of credit, distributive and purchasing societies, co-operative production—its advantages and its weaknesses.
  11. EXCHANGE.—Theory of barter. Conditions of gain of utility by exchange. Definition of a market. Extent of the market. Balancing of supply and demand. Temporary equilibrium of demand and supply. Joint supply and composite demand. Short and long period. Equilibrium of demand and supply. Monopolies. Determination of monopoly price in actual practice, Speculation and organized markets.
  12. DISTRIBUTION.—Balance of demand and supply for the factors of production. The principle of substitution. Mobility of the factors of production. Effects of introducing new methods and inventions.
  13. RENT.—Gross and net rent. The Law of Rent. Economic Rent, various forces determining it. Effects of improvements in Agriculture and transportation on rents. The relation of the law of diminishing returns to rent.
  14. INTEREST.—Demand for, and supply of capital. Differences between short and long term investments. Mobility of capital, between localities, between industries and from less to more specialised forms of fixed capital. Gross and net interest. Tendency to equal return on equally risky investments. The rate of return and the rate of interest. Quasi-Rents.
  15. WAGES AND THE POPULATION QUESTIONS.—General conditions effecting demand for and supply of

labour. Positive and preventive checks. Real and nominal wages. Apparent differences in wages. Mobility of labour. Differences of wages in short periods; their equalisation. Time and piece wages. Relation of labour and capital. The relation of population to the law of Diminishing Returns. Over-population and under-population.

16. PROFITS.—Normal profits as the reward of management and risk-taking and surplus profits as the result of special advantages in time, place and legal rights.

17. Causes of national wealth and progress.

Books recommended—

TAUSSIG : Principles of Economics, Vols. I and II.

THOMAS : Elements of Economics.

F. BENHAM : Economics [Pitman].

Paper II.—Currency and Finance.

NOTE.—Candidates are not expected to possess a detailed knowledge of the subject.

*Currency.*—The functions of money; qualities of good money material; importance of money; various kinds of money. Quantity theory of money value. Inflation and deflation. Index numbers. Various methods of Note Issue. War and the ruin of the gold standard. Post-war restoration of the gold standard: Economic depression and the gold standard.

*Banking.*—The nature of Banking; Types of Banks, functions of a modern banker; banking operations; Banking and money market, Fluctuations in bank rate in relation to trade, industry and commerce.

The Indian currency system, a brief historical retrospect from 1870 to 1925. Recommendations of the Hilton Young's Currency Commission, 1926. The present currency system in India.

*Indian Banking System.*—Exchange banks. Joint stock banks. Co-operative banks. The Imperial bank. The Reserve Bank of India. Defects of Indian Banking organisation. Lines of future Banking Development.

*International Trade and Foreign Exchange.*—Advantages Foreign Trade, International currency, Mint Par. Specie



Points. Fluctuations in the rate of exchange. Exchanges during the war and post-war exchanges.

*Public Finance.*—Classification of Public Revenues and Expenditure—Canons of Taxation, Incidence of Taxation. Public Debt. Principal heads of income and expenditure of the Central and the Provincial Governments in India.

Books recommended—

KRISHNA KUMAR SHARMA : Indian Money Market.

KRISHNA KUMAR SHARMA : Currency and Commerce.

JATHIER AND BERRY : Indian Economics, Vol. II.

HARROD : International Economics [Camb. University Press].

ROBERTSON . Money.

L. C. JAIN : The Monetary Problems of India.

C. N. VAKIL : Currency and prices in India.

SAYER : Modern Banking [O. U. P.]

B. R. MISRA : Indian Provincial Finance (Oxford University, Press).

Paper III.—Modern Economic Development of India and England.

1. The influence of geographical and social factors on economic development of India and England.
2. Economic organisation of India and England at the beginning of the 19th century. Later Developments.
3. LAND AND AGRICULTURE.—Brief study of Indian Agriculture before 1857. Effects of international competition on Indian Agriculture after 1857. Famines. Agriculture holdings in India. Land tenure. Yield of crops. Irrigation. Agricultural marketing. Agricultural co-operation. State and Indian Agriculture.

The English Agrarian Revolution and its results. Effects of international competition on English agriculture. Developments during the 20th century. Problems of today.

4. Industrial Development. Brief study of Indian industries before 1857. Causes of decline of Indian industries. Factory development. Detailed study of organised industries in India. Cottage industries. State and Indian industries.

Industrial Revolution in England ; its causes, developments and effects. Leading British industries and their future.

5. Labour Problems, Factory Acts. Trade disputes and Trade Disputes legislation. Trade Unions. Social Insurance. Problems of labour welfare and efficiency [in India as well as in England].
6. Transport. Railway development in India. Roads, Rail-road competition. Rivers and canals. India's demand for reservation of her coastal trade. Indian shipping and ship-building industry. Indian airways. The Navigation Acts of England. Growth of British railways. inland waterways in England. British shipping and airways.
7. Trade and tariffs. India's foreign and internal trade after 1857. Protection in India, Imperial preference. Indo-British and Indo Japanese Trade Pacts. Recent tendencies in India.

British Corn Laws. Free Trade. Effects of international competition on England. Foreign Trade. Imperial Preference. Ottawa Agreements. Future of British foreign trade.

Books recommended—

SRIVASTAVA : Modern Development of England and India, (Gautam Bros. Cawnpore).

MEREDITH : Economic History of England.

KNOWLES : Commercial and Industrial Revolutions.

JONES : Britain in Depression (Pitman).

JONES : Britain in Recovery (Pitman).

ALLEN : British Industries (O. U. P.)

JATHR and BERRY : Indian Economics, Vols. and II.

VERA ANSTEY : Economic Development of India.

GADGIL : Model Industrial Evolution of India.

The Indian Year Book, latest edition.

B. R. MISRA : Land Revenue Policy.

IV. SPECIAL SUBJECTS.

(a) *Advanced Accountancy And Auditing.*  
per I.—

Principles and practice of Double Entry Book-keeping.

Capital and Revenue. Depreciations. Reserves and Sinking Funds.

Partnership accounts, Accounts of limited companies including reconstructions, amalgamations, and liquidations. The Double Account system. Departmental and Branch accounts. Insolvency accounts. Bank and Insurance companies accounts.

Paper II.—

1. Income-tax in relation to accounts.
2. Interpretation and Criticism of published accounts.
3. *Either* elements of cost accounting *or* the principles and practice of Indian system of Accountancy.

N. B.—About one-half of the full marks of this paper (*i. e.* not less than 20 and not more than 30 should be assigned to questions on Income-Tax in relation to accounts, and the remaining marks should be allotted to questions on the rest of the course of this paper. The questions on the Indian System of Accounts may be answered in English or Hindi or Urdu.

Paper III.—

The objects and scope of audit. Vouching and verification. Audit of revenue accounts and balance-sheet. Depreciation and reserves. Divisible profits and dividends.

Rights, duties and liabilities of auditors.

Special points arising in the audit of banks, cinemas, hotels and jute, cotton, tea, coal, sugar, electric supply, light, Railways and insurance companies.

Investigation of Accounts.

Books recommended—

SPICER and PEGLER: Book-keeping and Accounts.

BATLIBOI: Advanced Accounts.

DROPPER: Accounting.

DE PAULA: Principles of Auditing.

LANCASTER: Principle and Practice of Auditing

BODDINGTON: Financial Statements (Pitman).

K. M. BENTHIYA: Hindi Bahi Khata (Rajputana Book House, Ajmer).

RUP RAM GUPTA: Income Tax for Accountancy Students (Agra Book Store).

(b) *Advanced Banking.*

## Paper I.—

1. Recent Monetary History and Monetary Controversies. Recent discussion of the nature and adequate definition of money. The problem of the Standard. The triumph of the Gold Standard in the last third of the nineteenth century. The re-opening of Controversy re: Bimetallism. The Gold Exchange Standard, the Theoretical implications of the Gold Exchange Standard. The effects of the War—Inflation and Dislocation of Exchanges. The rise of prices and the suggested stabilisation of the value of money. Fishers Compensated Dollar. Banking Policy and the price Level. The spread of Banking and the evolution of Banking theory. The War and the ruin of the Gold Standard. Cassel's theory of the Foreign Exchanges. The monetary theory of the Brussels and Geneva Conferences. Monetary stability. The return to Gold. Present Problems.
2. International Trade. The Principles governing the existence and distribution of international trade. Statistical problems in the measurement of international trade. The organization and operation of international markets. The balancing of international indebtedness. Taxes on Imports and Exports. Incidence of such taxes. Protection and Free Trades. Imperial Preference.
3. Foreign Exchanges. Types of bills of exchange—The mechanism of foreign exchange payments. Foreign exchange markets. Bankers and foreign exchanges. The rates of exchange. Purchasing power parity. Influences affecting the rate. Forward exchange. Arbitrage. The silver exchange. Dislocation of exchanges. The problem of stabilisation. How to read the foreign exchange article.

## Paper II.—

A detailed study of the Indian Money Market. Defects of Indian Banking. Effects of the War. A Central Bank of India. Adequacy and stability of the money market in India. Agricultural credit. Agricultural indebtedness. Co-operative credit, its development and present position. Industrial Banking and Finance

in India. Indian Public Debt. Post Office Cash Certificates. Means to promote banking development.

2. A detailed study of the Indian Currency System. Currency Policy in India. The Gold Exchange Standard, its working in other countries
3. Comparison of the banking systems of England, Germany, France, the U. S. A. and Indian Recent banking developments.

#### Paper III—

1. The ordinary practice of bankers with regard to the opening and conduct of banking accounts. Cheques, forms, endorsements, crossings, forgery and alteration, banker's marks on cheques, termination of banker's authority to pay cheques. Bills of exchange, forms, endorsements, acceptance, acceptance for honour, case of need, noting protest, stamp duties, discharge of a bill. Theory and characteristics of negotiability. Discounting of bills of exchange.
2. Banker's credits; traveller's letters of credit, circular notes, confirmed banker's credits, unconfirmed banker's credits, London acceptance credit, documentary credit, revolving credit.
3. Banker's advances; advance against marketable securities, goods and produce, real property, ships' guarantees, debts; debentures of companies, unsecured advances.
4. Banking Investments: Deposit of valuables with the Bank, Banks and customers Mechanism of the clearing house system.
5. Bank organisation, management and accounts.
6. Banking law relating to cheques, bills of exchange, promissory notes.

#### Books recommended—

DADACHANJI : History of Indian Currency.

TANNAN : Practice and law of Banking.

DAVAR : Practice and Law of Banking.

SPALDING : Banker's Credit.

KISCH : Central Banks.

PANANDIKAR : Banking in India (Longmans).

SAYER : Modern Banking (O.U.P.)

WHALE : International Trade (Home University Library)

TRUPTIL : British Banks.

MACKENZIE : Banking systems of Great Britain, Germany, France and U. S. A. (published by Macmillans)

Report of the Macmillan Committee on Industry and Finance (His Majesty's Stationary Office).

Report of the Indian Currency Committee and Commission.

Report of the Indian Fiscal Commission.

### (c) Geography

#### Paper I.—

1. Physical Geography involving broad knowledge of rocks, denudation, land forms soils—formation, classes, use, maintenance, etc.—important economic minerals and their distribution.

2. The atmosphere—Temperature and pressure of the air; movement of atmosphere; winds; cyclones and anti-cyclones; Permanent winds; rainfall; major climatic types and co-related vegetation and animal-life. Reading of climate and weather maps.

3. Production and trade in important commodities together with the industries based on them such as Rice, Wheat; Tea; Sugar; Cotton. Wool; Jute; Coal; Iron and Petroleum. Chemicals and Fisheries.

4. Transport [a] A few important trans-continental railways and their significance; [b] important ocean routes; [c] important air routes, particularly to India and the Far East and their commercial significance; [d] Trade Centres, Port towns and Industrial Centres.

#### Books recommended—

NEWBIGIN: Physical Geography.

CHISHOLM and D. STAMP : A Hand-book of Commercial Geography.

RUSSEL SMITH: Industrial and Commercial Geography.

GREGORY : Economic Geology.

LYDE : A Primer of Economic Geography.

R. N. DUBEY : Economic and Commercial Geography of the world.

A WILMORE : Ground work of Modern Geography.  
 PICKS : Introduction of Geography.

Paper II.—

General Economic and Commercial Geography of Asia with special reference to India. This will involve a study of the physical features, climate, natural vegetation, mineral resources, sources of power, agriculture industries and trade of the leading countries on a regional basis.

Books recommended—

BERGOMER : Economic Geography of Asia.

L. D. STAMP : Asia.

VERA ANSTEY : Trade of the Indian Ocean.

LYDE : ASIA.

Indian Year Book (Times of India, Bombay).

Indian Finance Year Book.

Paper III.—

A study of, any *one* of the following on the same lines as above.

(i) North America and Europe with special reference to Great Britain and U. S. A.

or

(ii) The Southern continents with special reference to British Dominions.

Books recommended :—

SHACKLETON : Regional Geography of Europe.

LABORDE : Western Europe and British Isles.

LYDE : Continent of Europe.

JONES and BRYEN : North America.

or

RUSSEL SMITH : North America.

WHITBECK : Geography of South America.

SUGGATE : Africa.

TAYLOR : Australasia (Physiographical and Economic).

WHITBECK AND FINCH : Economic Geography.

(d) Insurance.

Paper 1.—Life Assurance.

Principles and practice of life assurance. Use and purpose of the proposal and forms associated therewith. Life assurance contracts; their nature and characteristics. Insurable interest. Parties to the

contract and their rights and duties. Conditions and terms of policy and effect of non-compliance therewith. Assignment claims, surrenders, Re-assurance. Types of assurance. The prospectus—its general construction and uses.

Life office organisation: practice in connection with collection of premiums, revivals, loans, surrenders, claims and annuity payments. Compilation of statistics and records.

Mortality tables; the general nature, characteristics and use of the principal tables, including an elementary knowledge of the methods of construction. Life office valuations; sources of profit and methods of distribution.

#### Paper II.—Other Classes of Insurance,

Fire. The basic principles of fire insurance contracts. Fire policy conditions and their meanings. Insurable interest. Assignment policy. Subrogation. Contribution, average, claims, proximate cause, onus of proof, abandonment and re-instatement. Average clauses and loss apportionments.

Marine. Contract of marine insurance. Insurable interest and value disclosure and representation. The slip and policy. Premium and return of premium. Double insurance. Assignment policy. Warranties: the voyage; loss abandonment; partial losses and particular charges: salvage; general average; measure of indemnity. Subrogation; General Average Lloyd's.

An elementary knowledge of workman's compensation, insuranc, motor insurance, accident insurance and burglary insurance.

#### Paper III.—Insurance Office Organisation.

Constitution of insurance companies. Office; machines, staff organisation, management and remuneration. Officers of the company. Insurance organisation. Correspondence. Advertising. Branch control. Agency Seretarial Matters. Various returns under the Indian Companies Act and the Indian Life Assurance Companies Act. Insurance Accounts and investments.



## Books recommended—

- YOUNG : Insurance (Pitman).  
 LIEGH : Guide to Life Assurance (Pitman).  
 TAYLOR and TYLER: Life Assurance from Proposal to policy (Pitman).  
 ELDERTON and FIPPARD : Construction of Mortality and Sickness Tables (A. & C. Black Ltd.)  
 Indian Life Assurance and Provident Insurance Societies Acts and Rules thereunder.  
 T. D. DUTT : Law Relating to Life Assurance in India.  
 BROOKE : Fire Insurance Principles and Practice (Post Magazine, London).  
 GODWIN : Principles and practice of Fire Insurance (Pitman).  
 TEMPLEMAN : Marine Insurance (Macdonald and Evans, London).  
 EKE : principles of Insurance (Pitman).  
 WATSON : Talks on Insurance Law (Pitman).  
 WELSON and SHERRIFF : Insurance Office Organisation (Pitman).  
 WELSON AND HAMMOND : Insurance Accounts and Investments (Post Magazine, London).

(c) *Rural Economics.*

## Paper I.

- (a) Peculiar features of agricultural production as distinguished from manufacturing. Bases of agriculture; soil, sources of power, irrigation, drainage, implements and machinery, seeds, manures and cattle. Study of these with special reference to India conditions. Systems of farming in India and various types of rotation, combination and distribution of crops met with in India. Agricultural improvement and the work of the Agricultural Department in India. Marketing of Agricultural produce.  
 (b) Village communications.  
 (c) Marketing of agricultural produce.

## Paper II.

- Types of villages in India. Historical survey of land revenue in India. Systems of revenue settlements. Principles of assessment. Consolidation of agri-

culture holding. Ricardian theory in relation to land revenue in India. Application of the principles of taxation to land-revenue. Tenancy legislation in the U. P. Organisation for the administration of land revenue.

The importance and possibilities of cottage industries, including subsidiary agricultural industries such as dairy farming, poultry farming, fruit culture and market gardening, etc.

Constitution, functions and finances of district board and village *panchayats*.

### Paper III.

Rural indebtedness : its causes and remedies. State policy regarding rural indebtedness with special reference to U. P. Measures to avoid unnecessary debts. Restrictions on the transfer of land. The village money lenders. Co-operative credit movement. Co-operation in Germany and Denmark. Its usefulness to India Acts of 1904 and 1912. The various co-operative societies and their achievement. Land mortgage banks and State help to them. The Madras and Bombay schemes.

The rural reconstruction movement, village administration, sanitation, recreation and housing.

### Books recommended—

Government of India Resolution on Land Revenue Administration in India of 1902.

SELIGMAN : Economics of Farm Relief.

HOWARD : Crop production in India.

N. G. MUKERJI : Hand-book of Indian Agriculture.

CARVER : Principles of Rural Economics.

HOLMES : Economics of Farm Organisation and Management.

Report of Royal Commission on Agriculture in India.

U. P. District Boards and Village *Panchayats* Acts.

Report on the working of District Boards in U. P.

U. P. Banking Enquiry Committee Report.

B. G. BHATNAGAR : Co-operative Organisation in India.

H. L. KAJI : Co-operation in India.

STRICKLAND : Co-operation in India.

BRAYNE : Re-making of Village India.

DARLING : The Punjab Peasants in Prosperity and Debts.

OAKDEN : Report on Co-operation in the United Provinces.

(f) *Secretarial Practice.*

Paper I.

A detailed study of the Indian Companies Act, together with rules made thereunder.

Paper II.—The work of Secretaries of limited companies in India with particular reference to—

1. Formation ; issue of capital ; prospectus ; underwriting ; memorandum and articles of association.
2. Office organisation ; labour saving equipment ; filing systems.
3. Correspondence ; circulars to shareholders ; reports ; financial and statistical returns.
4. Statutory books ; returns to be filed with the Registrar.
5. Transfer of shares and debentures ; payment of dividends and interest.
6. Procedure at meetings of directors and shareholders, kinds of meetings and resolution ; notices ; agendas ; minutes ; proxies ; methods of voting.

Paper III.—Company accountancy. Indian Income Tax law. Elementary knowledge of current financial and commercial topics.

(g) *Actuarial Mathematics.*

Paper I. Algebra, including Probability.

Permutation and combination ; binomial ; exponential and logarithmic theorems ; inequalities ; convergency and divergency of series : partial fractions ; recurring series.

Probability as given in "Mathematics for Actuarial Students, Part II," by Harry Freeman.

Paper II.—Differential and Integral Calculus.

Elementary differential and integral calculus as given in "Mathematics for Actuarial Students, Part I," by Harry Freeman.

Approximate integration as given in "Mathematics for Actuarial Students, Part II" by Harry Freeman.

Paper III.—Calculus of Finite Differences.

Calculus of finite differences, including direct and inverse interpolation and summation as given in "Mathematics for Actuarial Students, Part II" by Harry Freeman.

Note—The "Mathematics for Actuarial Students Parts I and II" is published by the Cambridge University Press and is available in India at Macmillans.

## M. COM. EXAMINATION.

(For the Previous and Final Examinations of 1949).

### I.—Corporation Finance.

Promotion of a joint stock company. Construction of Financial Plan. Capital Structure. Types of corporate securities. Marketing of securities—need for special institutions. Underwriting of securities. Investment intermediaries. Stock exchanges, working capital. Short term Finance.

Management of earnings. Exploitation of companies. Financial re-organisations. Industrial mergers.

### II.—The Organisation of Industries.

A detailed study of the organisation, finance and management of the leading industries of India, viz., Cotton, Jute, Iron and Steel Engineering, Sugar, Cement, Paper and Pulp, Match, Coal, Glass and Heavy Chemicals. The Managing Agency System—Its advantages and defects. The Basis of Modern Industry : Resources—Natural and Human Capital. Labour Legislation and Organisation. Welfare Work. Combination Movement in the Indian Industry in relation to Industry. The Tariffs.

The principal Cottage Industries of India.

### III.—The Organisation of Markets.

Significance of a knowledge of marketing : Evolution of marketing organisation and practice—conditions prior to the Industrial Revolution ; modern industrial and commercial developments ; changes in marketing organisations and methods.

The characteristics of the market : Meaning of the term market : a perfect market ; an organised market ; different

concepts of the market (place, organisation, price making) ; classification of buyers and sellers ; classification of goods ; factors that control a market ; importance of co-ordinating production with demand.

**Marketing functions :** The marketing process, concentration and dispersion ; buying, selling transportation, storage, grading, finance and risk-bearing functions.

**Methods of wholesale distribution :** The operating problems of wholesalers. Organised wholesale markets.

**Methods of retail distribution and operating problems of retailers :** multiple shop system ; departmental stores ; co-operative stores, etc.

**Methods of mail order business.**

**Methods of sales promotion :** Brands and Trade Marks ; Personal Selling ; Press and other forms of advertising.

**Marketing of agricultural products with special reference to U. P. Rajputana or Central India (Cotton, Wheat, Jute, Rice, Seeds, etc.) .**

**Co-operative marketing of agricultural products in India.**

**Marketing of industrial goods.**

**Marketing of Shares and Securities.**

**Financing marketing activities.**

**Market risk and hedging.**

**Regulation of markets.**

**Government Marketing Organisation : Trade Commissioners, Marketing Officers.**

#### IV.—*Banking and Foreign Exchange.*

(1) Monetary systems of the leading countries. International Monetary Funds.

(2) Comparative study of the organisation of the Central and other banks of India, England, United States of America and Germany.

(3) Important International money markets and their distinctive features.

(4) Importance of foreign exchanges in modern economic development. Regulation of exchange rates. Fundamental causes of exchange movements, the purchasing power parity.

(5) Dealings in bills of various kinds. Investment in exchange. Borrowing by means of exchange. Speculation in exchange.

(6) Arbitrage. Specie shipments.

### V.—*International Trade and Fiscal Policy.*

The distinguishing features of international transaction. The study of international trade as a special aspect of trade in general; comparison with inter-regional trade. The international division of labour. The theory of comparative costs. Recent criticisms and elaborations of the classical doctrine. The gain from foreign trade. The barter terms of trade.

International payments in relation to monetary systems. The theory of international prices. The theory of purchasing Power parity. The Balance of payments theory of foreign exchanges. The mechanism of foreign exchanges. Bills of exchange; letters of credit and other media of international payments. Long and short exchanges. Forward exchanges. The place of gold in the international monetary systems. The future of gold. National monetary autonomy. Exchange Control. Exchange equalisation funds. Council Bills and Reverse Council Bills. India's foreign Exchange.

International capital movements, Equilibrium and disequilibrium in the balance of payments. Favourable and unfavourable balance of trade. Relation between balance of payments, and interest, rates and prices. Classification of transactions and their mutual interdependence. The foreign trade and balance of payments of India. Statistics relating to India's foreign trade. Home charges.

The theory of fiscal policy. Free Trade versus Protection. Bilateralism. Recent developments in international trade and fiscal policy in the world. The changing trend of trade. Trade of the industrial and agricultural countries. Tariffs and Quotas. The technique of tariffmaking. Most favoured-nation clause. India's fiscal policy. Discriminating protection; Ottawa Trade Agreement and the Indo Japanese Agreements.

### VI.—*Transport.*

1. *Railway Transport*—(a) Capital and Expenditure. Combinations. Rates and Fares. Classification of goods and minerals. Discrimination and undue preference. State Regulation of rates and fares. State ownership and management.

(b) Divisional versus Departmental organisation. Passenger and goods stations working. Rolling-Stock Distribution. Marshalling Yards. Wagon pooling.

2. *Indian Railways*.—Development, Relation to the State Management. Railway Finance, Relation to one another. Internal administration and executive organisation. Changes suggested by the Acworth Committee.

3. *Road Transport*.—Economics of road construction and maintenance. Theories of rates and fares. Types of road transport. Relation to the State, Relation of road to railway transport. Roads and road transport as means of opening up undeveloped and outlying tracts.

4. *Sea Transport*.—Outline of its development. Organisation of ocean transport services. Economics of marine transport. rates and fares. Competition and monopoly. Rate and traffic agreements. Pools and Conferences. Shipping rings. The Deferred Rebate System and the Rate War. Government aid and regulation of Ocean Transportation. Port, their functions and dues. Influence of the Great War on shipping. Indian Mercantile Marine. The Indian Navy.

5. *Air Transport*.—Modern Developments. Commercial possibilities of Air Transport. International Air Navigation. Commercial Organisation of Air Services. State versus Private Co-operation. Basic Principles of land and Economic Factors in the operation of services. Ground Organisation. Traffic control. Passenger, Freight and Mails. Present development of air transport in India.

*VII.—Law and practice of Income tax*  
Law and Practice of Indian Income-tax.

*VIII.—Company Accountancy.*

System of accounting suitable for companies engaged in different trades and industries, construction and criticism of published accounts.

*IX.—Principles and practice of Auditing*

Internal audit. Technique of auditing with special reference to limited companies,

Investigations. Reports. Other accountancy work falling within the scope of a practising accountant.

Rights, duties and liabilities of auditors.

*X.—Secretarial Work.*

A detailed study of Indian Company Law. Company secretarial work and practice. Elements of Company accountancy and income-tax and excess profits tax. General knowledge relating to commerce and finance.

*XI.—Statistics.*

(1) Collection, Classification, Tabulation, Presentation, Comparison and Interpretation of Statistical data.

Correlation, Logarithmic Curves and Curves representing the law of diminishing returns, etc., based on statistics. Association and contingency. Graphic Algebraic and other methods of interpretation and extrapolation. Forecasting of fluctuations of economic phenomena. Methods of measuring and forecasting of population growth. Accuracy and sampling. Significance of observed differences between averages.

(2) Collection of data [official and private] and actual construction of tables, diagrams, etc. based on those data regarding any one of the following: Wages, Prices, Population, Family Budgets, Marketing Surveys.

(3) Importance of Statistics in India. Availability and adequacy of statistics in India. Need for more intensive and extensive investigation in India.

*XII.—Labour Problems.*

British Labour Movement—History up to the present time. Trade Unions; structure; functions and Government. Industrial peace, conciliation and arbitration. Education and Research Department. International connections.

Indian labour—Village background, connection and influence. Recruitment, conditions, security, promotions. Hours Wage. Minimum Wage. Child labour.

Labour of Women. Trade Unions: Characteristics, history, future industrial peace; works committee. Machinery for conciliation and arbitration. Health, diet, maternity benefits, industrial diseases, town-planning, housing, village-settlements; Building regulations and sanitation. Education, general and technical agencies. Debts, co-operative credit and distributive stores.

Life of labouring classes in typical Indian industries; cotton, jute, coal, metallurgical, mining, shipping, railways, plantations, seasonal industries.

Labour and the constitution, central, provincial and local.

Labour research and statistical bureaus.

International Labour Organisation. Pre-War history. Constitution, Organisation and Functions. Achievements. Prospects.



*XIII.—Co operation*

Co-operation as a principle. Its application to modern business life. Its genesis and development in Europe. This part is to cover all the European countries about which literature is available such as Germany, Italy, Russia, France, Denmark and England.

Co-operation in India. Its evolution and history. Co-operative law in the various provinces. Various forms of co-operative activity, credit and non-credit—their constitution and working principles . . .

Various forms of co-operative activity. Degree of success achieved in the various provinces.

Organisation for propaganda and control. Co-operative Finance and Accounting. Co-ordinating and higher agencies in the Co-operative Movement. Criticism of the existing things, and lines of further developments.

*XIV.—Rural Economics.*

(1) Rural Organisation :—A historical sketch. Leading features of village life in India at present. Famines.

(2) Organisation of agriculture and the scope of co-operation therein :—

(a) Irrigation and dry farming, manuring and rotation of crops. Implements, Live-Stock.

(b) Consolidation of holdings.

(c) Credit and Indebtedness.

(d) Marketing.

(3) Land Tenures and Assessment with special reference to U. P.

(4) Agricultural Education, Research, Demonstration and propaganda.

(5) Local Boards : Education, Sanitation, and Public Health, Roads

(6) Problems connected with pasture lands and forests.

(7) Subsidiary occupations for agriculturist.

*XV.—Public Finance.*

Importance of Public Finance.

Public Revenue, Principles of Taxation : Problems of incidence. Taxation of monopolies. Tax and non-tax revenue. Effects of taxes on production and distribution.

Public Expenditure : its effects on Production, Distribution and Consumption.

Public Debt : various forms of public debt. Method of repayment. Public Debt in India.

Financial Administration.

Finances of Government of India ; provincial governments and local authorities.

War Finance.

#### *XVI.—Geography.*

A detailed study of the economic and commercial geography of India based on the natural environments, involving both a topical and regional study on the following lines :—

Position structure and geology, physical features and land forms, climate and weather, irrigation, natural resources mineral, forestry, animal and agricultural and the industries and occupations depending upon them.

Important sources of industrial power and important manufacturing industries. Internal and foreign trade of the country. Quantity, quality, direction and development of foreign trade. A detailed study of exports and imports and future possibilities of change. Communications and transport facilities—railway roads, waterways and airways. Important sea-routes connecting India with other parts of the world. Important industrial and trade centres and ports. A brief study of commercial policy.

#### *XVII.—Stock Exchange.*

Functions of stock markets. History of the principal stock exchanges of the world. Developments of stock markets in India. Constitution of Indian stock exchanges. Classes of securities. Transaction of business, short selling, options and arbitraging. Fluctuations in security prices. Official quotations and listing regulations. The recent war and stock exchanges. Stock exchanges reform in India.

#### *XVIII.—Insurance.*

A detailed study of either (a) Life Insurance or (b) General Insurance.\*

##### **EITHER**

##### **(a) LIFE INSURANCE.**

Principles and practice of Insurance : The contract ; insurable interest ; Policy conditions ; Compound interest

tables ; Mortality tables ; kind of policies ; calculation of premiums ; occupational risks ; under-average lives ; valuation ; reserves ; bonus distribution : title to policies of life insurance ; assignment of policies ; surrender values.

Life office organisation ; life insurance salesmanship ; investment of life office expenses.

Insurance book-keeping ; official returns, law of life insurance.

*Or*

**(b) GENERAL INSURANCE.**

*Fire Insurance.* Basic principles of fire insurance contracts including a knowledge of fire policy conditions and their meanings ; average warranties ; moral hazard ; fire waste ; cost price of life insurance and unexpired risk.

Practice of fire insurance including modifications and developments ; reinsurance ; renewals, settlement of claims, assignment of policies

*Other Classes of Insurance* Principles and practice of other classes or general insurance, viz marine, accident, motor guarantee, burglary, public liability, workmen's compensation.

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# AGRA UNIVERSITY

## NOTICE

"THE STATUTES AND REGULATIONS" relating to all the examinations of 1948 are published separately and can be obtained from the Publishers, Messrs. Gaya Prasad & Sons, Educational Booksellers, Hospital Road, Agra (and not from the University Office as heretofore) on payment of rs. 8 on account of price and as. 5 on account of postage and registration charges. These Statutes and Regulations supersede all the Statutes and Regulations published before January 1947. Copies can also be obtained from the same firm by V. P. P.

The Statutes and Regulations for all the examinations of 1948 will be published in June 1947.

SENATE HOUSE,

AGRA :

June 22, 1947.

L. P. Mathur, D. Sc.,

Registrar.

# AGRA UNIVERSITY

## NOTICE

COPIES of the "Text-books and Syllabuses" prescribed for the examinations to be held in 1947, 1948 and 1949 can be obtained from the Publishers, Messrs. Gaya Prasad & Sons, Educational Booksellers, Hospital Road, Agra, on payment of

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Copies of the Medical Syllabus will be available at the office of the Agra Medical College, on payment of the price fixed by the Principal of the College.

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AGRA :

June 22, 1947.

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